RADICAL SCIENCE JOURNAL Nº5

MEANWHILE, BACK AT CONTROL SCREEN 27, THE SHIFT TECHNICIAN CONTINUES TO STRUGGLE - ALONE - WITH THIS MONTH'S SELECTION FROM THE GREAT BOOK CLUB.....
"IN MANUFACTURE THE REVOLUTION IN THE MODE OF PRODUCTION BEGINS WITH THE LABOUR-POWER, IN MODERN INDUSTRY IT BEGINS WITH THE INSTRUMENTS OF LABOUR."
GREAT.... BUT TRICKY- IT'S NOT QUITE GOT TO ME YET, MAYBE NEXT MONTH....

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1977

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The aim of this journal is to provide a forum for extended analyses of the ideology and practice of science and technology from a radical political perspective.

The journal is edited and produced by a collective whose members are: Philip Boys, Gavin Browning, Charlie Clutterbuck, David Dickson, Brian Easlea, Tony Fletcher, John Goodman, Dot Griffiths, Mike Hales, Max Henrion, Luke Hodgkin, Brian Hurwitz, Mark Jones, Les Levidow, Maureen McNeil, Gianna Pomata, Fred Steward, Margot Waddell, Gary Werskey, Bob Young and Michael Young.

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Articles should ideally be less than 10,000 words and typed, using double-spacing. A number of copies would help, as it is our policy that all articles submitted should be read by as many members of the collective as possible. As this usually takes some time, please bear with us—and remind us when your patience runs out.

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RADICAL SCIENCE JOURNAL

Editorial

It is now almost four years since we first came together as an editorial collective to discuss the publication of a Radical Science Journal. Five issues later, those of the original collective who remain, and those who have since joined, feel justified in claiming a certain sense of achievement about the journal. The last issue, we think, was grounded more concretely in the practice of both politics and science than previous ones, and we hope that we can maintain this contact. We have sorted out some of the operational problems of collective practice, and hope that we now answer mail and file information more effectively than in the past. We are taking an active part in setting up a distribution co-operative which is distributing a variety of left journals to bookshops around the country And we also feel that we have contributed to raising the general level of debate about the nature and function of capitalist science and technology.

At the same time, we have been forced by circumstances to think harder about the implications of our ideas for people's lives. Two members of the collective who are working scientists have resigned and, in presenting their reasons for doing so, have pointed to a number of crucial problems which *RSJ* must take seriously if a "politics of science" is to become, in any sense, a "politics for scientists". Namely, how can a working scientist live out the contradictions made explicit

by our critique? Such a scientist encounters real practical conflicts in her or his work setting, since a genuine attraction to one's work can lead to defending a professional niche, to working unsocial hours at low rates, and even to competing with others as part of the established behaviour of the scientific community, rather than to solidarity. All of this may overlay a real conflict between the intellectual and aesthetic attraction of one's work, and the uses to which it is put. And it will also counteract any attempt to generate a subversive collective consciousness among scientists. Our critique of scientific ideology has too little relation so far to these problems as experienced first-hand by scientists.

In this respect, it's not coincidental that our articles have in the main been written by people who work in the theory (history, sociology, or philosophy) of science, or who are ex-scientists. The nature of scientific culture can be discouraging to attempts to theorise one's practice within the lab, firm, or university—still more so in the perspective which *RSJ* has increasingly taken. And at present the collective is investigating the critique of science as a key to the Marxist understanding of modern capitalism. While this direction gives us a stronger sense of our *raison d'être* and enlarges the possible scope of *RSJ* projects, it could also aggravate the problem of the journal's distance from the daily concerns of working scientists. An 'outsider' does not directly feel the effect which our attack on the role of scientific knowledge, and scientists as mediators, may have on a working scientist, for whom there can be a quite different, personal conflict: between on the one hand staying in a job which she/he *likes* and trying to develop a political practice there; and on the other, submitting to an externally-induced guilt about one's social role and abandoning science for—in 1976—what? There seems to be a contradiction between 'liking science' and a politics such as our articles and editorials suggest (although sometimes with an eye to the utopian future, which may not always be obvious . . . .).

This extends to a conflict between '*RSJ*-type politics' (what is implicit in our articles and editorials) and the older politics of science expressed by unions and pressure groups. We recognize this conflict and our contribution to it. We think it should provide a framework for working out our differences in practice, as part of the wider radical science movement. Our attack is part of a general attack upon monopoly capitalism and imperialism and, as Braverman points out (see *RSJ*4), it is because the system we are fighting is overwhelmingly science-based that we need to take a hard look at science itself and to point out that capitalism *is there, too*. So far, this is the major contribution that we have made, and the ensuing politics has been mainly implicit. It is true, of course, that Gary Werskey (*RSJ* 2/3) criticised some of the past

politics of science, and that Charlie Clutterbuck (*RSJ* 4) analysed a campaign in which the British Society for Social Responsibility in Science was involved with shop-floor workers. But apart from this, there has been little discussion of the practical political implications of the theory we are constructing; and in places it is only too easy for the working scientist, confronting our critique of capitalist science, to read between the lines: "How can you call yourself a socialist and continue to work as an agent of oppression in this way?" That question refers to the mental/manual labour distinction, to the division of labour, and to many other contradictions which we consider important. By the nature of capitalism, *all* those who read or write *RSJ* are agents of oppression in one way or another—most have tertiary education, are white males, and know how to make sure their kids pass their exams.

Yet this is altogether too simple a message. The specificity of the scientist's role as 'expert and mediator' is complex and important (as pointed out in John Goodman's letter in *RSJ* 4). A political practice—or better, political practices—for such experts is still very much in an early stage of construction. Recently we have had a quite successful unionisation of professional workers in Britain, but of a very limited kind; differentials, status, and hierarchy divide even unionized workers from their co-workers, their fellow unionists, and the rest of the trade union movement. Are we to wait for the inexorable "proletarianisation" of scientists to force them into a class identification with the working class? There's no strong reason to believe that it would do so, at least not in the short run. In the meantime, working scientists, who are justifiably fighting *against* proletarianisation and the loss of the relative enjoyment they get from work at present, can't be told to sit and wait. Once again politics itself is more complex than such simple prescriptions. We hope that the Journal's work can help you in your struggles as scientists, to push those struggles beyond their institutional limitations, for example, by clarifying the increasingly illusory professional privileges that tie scientists to their employers. But this needs contributions from the activists who we hope are reading this.

David Triesman's article on struggles at the Institute of Psychiatry in this issue provides an image, complementing Charlie Clutterbuck's, of one kind of action that is possible, this time in a trade union/institutional context. The plan proposed by the Lucas shop stewards combine is another; we hope to publish an article on this in the future. All these have a common strength and weakness of a good political action; they are specific to the particular conjuncture (in a given firm or institution at a given time) and so can't be generalised in a formula. (One may think it would be good to create many Vietnams, but to say so does not show how they would be created.) All the same, by printing

studies like these we hope to provide a source of new ideas which can be drawn upon, and which can outpace, and eventually replace, a politics where scientists' only role is as experts, with the hierarchy of politics reproducing the hierarchy of the scientific world (and vice versa).

We feel all the more able to make this assessment of our need for political writing in that, as we said earlier, the theoretical work we have produced is beginning to establish itself as a fairly solid and coherent contribution to a field which badly needs one. (In this issue in particular, Bob Young's article is an attempt to develop a *general* formulation of the changing relation to science among Marxists.) Even if we thought that Marx and Engels said it all as regards political economy, they certainly did not for the politics of science (although their contribution is important and needs more assessment). The same issues must be argued out with respect to Lenin, Gramsci, Mao, Reich, and a number of others (perhaps even Popper and Kuhn). There are traditions of Marxist thought about science which need investigation (some more than others). But one only has to give a talk on the politics of science to an audience of activists to realise that the failure to appreciate the importance of science in practice is almost universal, and that this failure goes back to old problems. Science as such is untheorised in the Marxist tradition, or so badly theorised that it becomes *unpolitical*. For example, science is seen as the national home of the dialectic (Engels) or the model for Marxism-Leninism (Althusser). Sometimes one gets the impression that nothing as dirty as fertilisers, insecticides, nuclear waste or D&C's could live there at all. Hence, as in so many areas, bad theory serves to justify bad practice (or no practice at all). And the distrust of theory can have results which are just as bad in the long term.

So to construct a politics of science appropriate to the present, we must, as we go along, construct a theory of science in the modern capitalist social formation. It must not skirt awkward issues (population and resources, for example, or science in the USSR, China, and Third World, all of which we seem unable to find anyone to deal with), and it must be political. As we continue we hope to approach areas which we have not dealt with before, and to connect with radical theory in those fields. For example, science pervades much of today's popular culture—films, TV, novels, science 'fact' and 'fiction'; the article by Pat Parrinder which we publish here is a beginning, we hope, of analysis of this scientific presence.

These are some of our aims. But, like many left journals, we don't have much idea of how they relate to the aims of the people who discuss and (we hope) apply the journal. Is our feeling of achievement shared by Aarhus University or Carl Zuntz? Some readers do write and tell us what they like or dislike and—even better—ask for extra copies; but we would like much more comradely praise and criticism. Is the journal turgid and theoreticist, or sloppy and populist? We have to live with it, giving up days or evenings which might be spent improving relationships, enjoying friends and children, going to other meetings or the pub, watching television; its intrusion into the personal lives of the collective's members can be resented enormously. In different ways we're all committed to making a more integrated life style, but in the long term it's difficult (although moments of vision can make it seem easy).

Among the difficulties is the *impersonality* of a journal. It is indeed partly some friends and comrades working together on production. But in times of strain, the *project*, the boxes of journals to be sent off, the card indexes, the plans for future articles, have to hold us together. And the more voices there are from outside giving us or asking us for opinions or telling us of what others are doing in politics of science, the less anonymity there is in this particular process—producing a journal, with comrades, under restraints. (What price is reasonable for the next issue/next year's subscription? How are we to deal with a bad article on a crucial issue? Why don't more of the collective answer the post? What should we publish on specific issues, such as Althusser's notion of science? Third World technology?)

Through several years of practice, we have become utopian in a more practical way. We know through experience that we are not going to love one another in the immediate future just because we share the same political concerns, and that the *political* has to be the dominant factor in our coming together. (It seems naive to express the disappointment that this represents, but it must be registered.) We hope to form, with your help, part of a larger working collectivity—those who are engaged in the politics of science from a point of view which is at once critical (not accepting simplistic solutions) and political (seeking solutions in order to work with them).

All of which leaves aside the diversity of political choices. However unpleasantly expressed, the shades which separate Trotskyist, old Stalinist, new post-Stalinist, Maoist, libertarian, situationist all represent different politics which—as we are involved in the class struggle and have to make choices—we ultimately can't evade. In fact we *hope* that such conflicts, insofar as they are productive, will take a place in this journal which they haven't occupied so far.

Letter

A NOTE ON 'SCIENTISM'

Dear RSJ,

For some time I've been feeling uneasy about the use of the word 'scientism', which plays an important part in radical politics of science. I take it that this means something like the expression of ruling class values (ideology) imposed by masquerading as science, for example when tests are devised which prove blacks/women/the working class to be genetically inferior—to take, as we usually do, the crudest case. If, however, we think—as we've often said in this journal—that in *any* scientific practice it's impossible to separate out the ideological component, then the implicit distinction between scientism and 'real' science seems to me to vanish. Galileo and Darwin are more or less scientistic in the above sense, and the particular attack we want to make on Skinner and Jensen is not that their science contains an ideological component, but that the ideology is racist and sexist.

I'd be happy to accept Althusser's definition of scientific practice (working on knowledges to produce new ones) *without* his implication that there is a line which can be drawn separating scientific practices from ideological ones. At which point I think we should concede that Marxism is undoubtedly a science—but so is utopian socialism and, for that matter, astrology when done seriously. All of these involve an attempt to produce knowledge; the knowledge is always produced in conditions where ideology permeates it; and so, to the extent that they present themselves as scientific, they are 'scientistic'.

It seems to me that, though it may be useful to keep 'scientism' as a dirty word in our everyday political vocabulary, or to preserve it for those practices which haven't laid their ideological cards on the table (and which have?) as long as we use it in serious attacks we lay ourselves open to the kind of objections I've outlined. Can you help me?

Yours,

Luke Hodgkin

David Triesman

The Institute of Psychiatry sackings

Introduction

In this article I consider some of the issues raised during the industrial dispute in 1973-4 between the Association of Scientific, Technical and Managerial Staffs and the London University Institute of Psychiatry. I make no attempt to consider all the questions which this dispute raised; in all probability any list which I made would not be considered exhaustive by other participants in, and observers of, that situation. This text therefore shelves problems which occurred in the context of Union organisation; such questions pertain to strains within trade unions where very different types of employee have come together, to strains in relations between full-time officers and ordinary members, and to strains due to the relatively novel process of white collar trade unionism. It equally shelves minutiae in the conduct of the dispute. Rather, I will attempt to handle the development of the dispute in terms of the principal scientific issues that lay between the protagonists. I will argue that clashes between different political understandings of society, reflected in this research institution as differences of scientific theory and method, are likely to fall increasingly within the scope of industrial relations.

One other word of caution should be expressed at this stage. A difference of opinion on scientific questions is commonplace in academic institutions. The existence of clashes of this kind lead, in general, to one of two consequences. Either an authoritarian solution is imposed, where a powerful group or an individual suppresses the view of his or her subordinates; this they must either swallow or resign. In such a case, the straightforward exercise of power is usually hidden by some device. It will be said, for example, that the individuals were "not happy working together"—that is, there is said to be an interpersonal rather than scientific or ideological conflict. Alternatively a more liberal solution is advanced—that the two parties (in the simplest of disagreements) are each entitled to espouse the

view they have and to promote it. This approach is often dignified by the label "academic freedom".

This latter approach has much to recommend it, and organisations like the Campaign for Academic Freedom and Democracy have done much to enlarge its effect. It contains a progressive moment. But it seldom operates in a simple way, and even where it appears to do so, it tends to hide real discrepancies of power between people at different levels of a hierarchy. It cannot strategically grasp academic conflict situations and, consequently, it is tactically limited. It encourages us to believe that we live in a world where we may freely pose ideas as coequal, irrespective of their theoretical quality, and it also ignores the power relations between those who hold the ideas. Equally, it takes no account of the relations of the ideas being discussed in any particular circumstance with those held in the wider society, and their ideological status.

Thus, where "academic freedom" is requested or demanded by subordinates and is not granted by an academic management, the appeal made to its abstract properties is often in direct contradiction to the concrete power relations on which it would be more relevant for the subordinates to focus. Once again resolution of conflict is usually achieved by the subordinate party standing down and often resigning. Calling for what amounts to moral support around the banner of "academic freedom" from equally subordinate colleagues—who face the same concrete power reality—has not proved a basis for solidarity in action. Hence the tactical limitation.

However, there is a third course. The emergence of two trade unions in the British academic sector, the Association of Scientific, Technical and Managerial Staffs (ASTMS) and the National Association of Teachers in Further and Higher Education (NATFHE) has altered potentials and tactical perspectives.[1] At present, the impact is limited, and in the long-term struggle over ideological questions there will continue to be insurmountable obstacles to what trade unions can do. But it is important to be clear about the potential.

"Conditions of work" fall among the spheres commonly resolved by negotiation between management and work force representatives. Where industrial negotiation fails to establish appropriate conditions, industrial disputes tend to resolve the problems one way or another. The resulting conditions are frequently specified in some detail, and where a union is recognised, any alteration to them requires that the parties go through a mutually accepted procedure—an agreed sequence of prescribed steps which are designed to facilitate a settlement.

Conditions of work vary enormously, industry by industry, and while legislation usually establishes minimal conditions, unions have secured many advances on these base-lines. Very specific rulings on health and safety are related to particular forms of production; length of rest and social periods,

and aspects of manning arrangements, are related to arduousness and concentration required. Over extended periods the conditions won by the work-force become enshrined as time-honoured arrangements dictated by "custom and practice". For obvious reasons these provisions are advantageous to the work-force in that they make the work endurable, and they may also benefit employers, as they allow a certain amount of planned "social engineering" of the work-force.

Currently, however, union membership is extending into new spheres of activity, and "conditions of work" provisions of kinds not previously known have extended into white collar employment. In many cases, unique and unexpected problems have arisen. For example, dental technicians (principally in ASTMS) are often required to work with new synthetic materials, the properties of which are not fully understood. When they are heated, technicians have reported discomfort; they run risks of being poisoned, of inhaling carcinogenic particles, of eye and mucous membrane damage, and so on. Here is a clear area where work conditions—in terms of establishing new safety criteria for handling materials—must be subject to updating in the light of expert knowledge and new experience.

The advent of unionisation among academic staffs poses equally distinctive problems of work conditions, although many key features of their relations with employers are more similar to other forms of employment than most academics care to acknowledge. The nature of academic work involves the employment of individuals for their particular expertise, often in highly specialised fields. They are hired to use a lengthy, accumulated training in their disciplines to achieve particular goals, and for the most part these goals cannot be approached by those without that training. Thus the staff are often employed to demonstrate abilities which are not possessed by those who manage the staff. In practice, this often tends to undermine formal aspects of hierarchy while leaving hierarchical organisation entrenched. Acute conflicts can arise between a work role which is necessarily relatively autonomous, involving specialised expertise, and a hierarchy of persons who claim sole prerogative in the direction of all aspects of research in areas where they have neither theoretical nor methodological competence. (The phenomenon has been studied elsewhere in Dalton's (1950) "Conflict between Staff and Line Managerial Officers" and Goss' (1961) "Influence and Authority among Physicians in an Outpatient Clinic").

We are now coming to realise that academic work is not so removed from other occupations. The underlying structures of conflict which are present in industry constitute, in a distinctive form, the conditions of work of academics. For an employment situation to remain viable, these problems must be resolved, just as the health and safety of dental technicians constitutes part of the problem elsewhere.

In the case of academic staffs, dictatorial authority—and it is by no means possible to classify all authority structures as dictatorial—produces conflict

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at four levels. These conflict levels occur whether the "authority" operates under an umbrella rationale like "management has a *right* to manage", or whether they invoke some mirror image of the family structure in which they remain patriarchal head. These conflicts arise when:

1. They instruct staff to conduct work which they are not qualified to conduct;
2. They instruct staff to build into their disciplines concepts and concept boundaries that are theoretical distortions or are inoperable in those disciplines;
3. Instructions are given to conduct "interdisciplinary work" under the exclusive direction of one of these disciplines, usually that of the directors of research, which is imposed in order to provide a sheet anchor of ideological orthodoxy;
4. They give instructions to conduct work regarded by the staff as unethical.

(These conflicts, of course, have direct parallels in many sections of productive work including industrial research within capitalist order.) Unresolved, the conflicts destroy the viability of basic conditions of work. In order to obtain protection for adverse conditions, staff must regard them as included in the area in which organised work people are represented by their unions. This certainly adds to the complexity of local and professional organisers' negotiating roles, but the very fact that new sectors of the work force have been unionised has inevitably had that effect.

In a recent ASTMS circular, General Secretary Clive Jenkins recognised this key point very clearly, in a related context: "There are now proposed seven new Acts of Parliament or pieces of legislation that will affect, radically, our members, and these will need to be the subject of intensive training for full-time officers and representative members." Recently, in a series of ideologically-related industrial disputes, workers at the Design Centre, the British Film Institute, Swansea and Edinburgh Universities, and at the Institute of Psychiatry in London, have tried to register their view on the content and conditions of their work. And the union has had to respond to these new situations. Education programmes, in ASTMS at least, are increasingly geared to their emergence.

Medical Feudalism

What, then, were the relations of forces at the Institute of Psychiatry, and what where the types of issue on which these forces clashed? Although it is necessary to answer the second question first, a schematic account of the context may help.

The Addiction Research Unit (ARU) was established in 1968 at the London University Institute of Psychiatry, the principle postgraduate training institution for psychiatrists. Within the Institute are departments teaching psychology and other bio-medical disciplines, but the Institute's role is

mainly a research one. It is formally managed by the usual academic apparatus, with a committee of management and an academic board, and, as usual, authority lies in the hands of a small core of senior professors who, in this case, are psychiatrists. Within the Institute, which is attached to the Maudsley Hospital, there are a number of organisations which either represent or are said to represent the interests of the staff. Thus there is a Junior Academic Staff Committee, which is a mechanism for career aspirants to maintain a collusive and acquiescent relationship with their seniors. It is through this mechanism the Institute nominally handles its internal hierarchical conflicts.

Then there are the trade union and professional associations. A very small number of the academic staff are members of the Association of University Teachers, a professional association which has recently decided to seek affiliation to the Trades Union Congress. At the time of the dispute it had a total Institute membership of 18 and its officers were members of the management. The technical staff, some administrative workers and a growing number of academics were members of ASTMS which had nearly 80 members, and which represented the majority of technical staff in several departments. Secretaries and other staff were members of yet another union, which decided not to become involved.

The establishment of the Addiction Research Unit took place at a period of growth in public awareness in the numbers of officially recorded heroin and poly-drug users was constituting a recognisable problem.[2] As a result of a directive from the then Minister of Health, the Medical Research Council (MRC) deployed resources in drug-use research, and the Institute of Psychiatry managed to tag alcohol and tobacco use on to the package. The research was to be undertaken by a "multidisciplinary team" and successive annual reports of the MRC emphasised that sociological methods were regarded as of seminal importance. The MRC believed that this was the area in which it might be possible to break through, in that the social context of behaviours was likely to prove crucial. This context could not possibly be illuminated by other disciplines.

There is considerable ground for believing that the MRC had no idea what this judgement on their part implied in practice at the time that they made it. The council appears to have formed no view as to what was an appropriate way to deploy social scientists in an institution deeply committed both to hospital-based medical hierarchy, and to medical models of explanation. Those at the Institute seeking the grant were concerned to put together a package capable of winning the money; those giving it were concerned to show they were aware that drug use occurs in, and is culturally conditioned by, the environment in which it happens. If the MRC wanted to use social scientists, the Institute would write them into the programme. Thus all ARU documents of the period show a mixture of unthought-out premises and complete atheoreticism. Indeed, the submissions were so limited that

there are no early statements about theory or method, a fact never commented upon by the MRC whose supervisory committee for the ARU was headed by Sir Martin Roth, the president of the Royal College of Psychiatry.

This shouldn't obscure the essential facts which are implicitly present despite all the social science rhetoric:

1. It was decided to locate this social science workshop at a postgraduate medical institute, entirely governed by psychiatrists whose familiarity with social science could have been described at length on the back of a postage stamp. Therefore, either the governing body of psychiatric deans, professors and director were going to allow the staff to pursue their own scientific interests and perspectives, or they were going to insist on methods with which they were familiar—medical causality models. Thus, organisationally, the Institute inaugurated the common medical hierarchy, based at every level on patriarchy and nepotism in management and demanding single-minded career interest from staff. It was based on what Max Weber described as "patrimonial authority, which represents a variety of patriarchy, (where) the system of inviolable norms is considered sacred. An infraction of them would result in magical or religious evils. Side by side with this system there is a realm of free arbitrariness and favour of the lord, who in principle judges only in terms of 'personal', not 'functional' relations." (Gerth and Mills, 1948). It was this order that the Institute of Psychiatry chose.
2. It will be noted that the research grant application grouped drug,

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IDEOLOGY AND SUPERSTRUCTURE IN HISTORICAL MATERIALISM (1936) by Franz Jakubowski; London: Allison & Boyd, 1976.

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SOCIAL AMNESIA: A critique of Conformist Psychology from Adler to Jung by Russell Jacoby; Boston: Beacon Press, 1974.

An important study of the relations between psychology, ideology, and society.

alcohol and tobacco use. There are two possible reasons for grouping research topics. Either, in institutional terms, it is organisationally worthwhile. Or it is assumed that there is some common link–usually expressed at the level of theory–among the behaviours which makes their study under one roof desirable. As the staff working on each area of "use" were strictly segregated, the first reason can be ruled out; there were no organisational payoffs. As to the second, the assumed theoretical link soon emerged. The use of all three types of psychoactive chemical was believed to be motored by the same "basic" behavioural compulsion. Thus each could be understood, whatever the cultural dissimilarities between the activities, exclusively in terms of personality predisposition (genetics) or learned behavioural performances. Whatever the grant-seeking rhetoric there was to be no sociology in the ARU.

3. Those responsible for setting up this research unit were already making their careers in the area of the psychiatric treatment of "personality disorders" related to the use of psychoactive substances. To have allowed the direction of research to alter would have dramatically impeded their personal advancement at a stage in their careers when switching to other specialisations or other career advancement channels would have been most disadvantageous to them. Indeed, there are strong grounds for saying that they had been instrumental in defining through labelling, the very "social problem" spheres which they were now the leading authorities in treating. They had, in the context of this country, propounded many of the inadequate definitional criteria aimed at establishing the use of the above substances as hard evidence of the presence of illnesses.

Thus they were useful figures to the Establishment in an ideological sense. The establishment of a phenomenon as pathological rather than social eliminates any necessity to consider questions like social determination, class distribution of the phenomenon, the nature of choice involved in the activity, or, indeed, any theory where human volition has to be incorporated. The often indistinct border, in deviance, between medical and social phenomena becomes hardened where medicine is able to claim exclusively that the behaviour falls within its province. The behaviour becomes the *involuntary* consequence of the illness. The doctor becomes, quite automatically, the appropriate custodian of the problem area. In this way, not only the behaviour but whole spheres of social theories of deviance are eliminated by imposing a medical categorisation and we turn to drugs or other treatments for solutions, never to social change.

In an article on this process, "The Professional Ideology of Social Pathologists", C. Wright Mills (1943) notes that this development gives rise to the poorest research and the most eclectic publications. "The level of abstraction which characterises these texts is so low that often they seem to be empirically confused for lack of abstraction to knit them together. They display bodies of meagrely connected facts . . . and intellectually

sanction this low level of abstraction. The 'informational' character of social pathology is linked with a failure to consider total social structures." The most careful reading of ARU publications reveals no hint of conceptual or abstract thinking; the assemblies of facts are not even meagrely connected. Not only would such a reading confirm the truth of Wright Mills' assertion, but it makes clear that it is a necessary consequence of this method of organising research of "social problems".

This article is not intended to appeal, uncritically, for a sociological approach, nor would a complete lack of differentiation between different "sociological" approaches be appropriate if my task were to pose alternative theories and methods for conducting research on psychoactive substance use. To sort out the moribund areas of sociology in relation to such a research subject would require a separate article. At this stage I want to make the general proposition that any attempt to comprehend particular kinds of event involving interactions between persons in more or less structured relations is not merely blunted by the constraints imposed by medical models discussed above; it is completely obliterated. For only constructs involving personal pathology are deemed to be necessary in the explanatory systems; pathological occurrences, it is "well known", require medical care, not social action.

Three implicit goals of the MRC and, certainly, of the Institute of Psychiatry, necessarily give rise to the adoption of three approaches—one could not dignify them with the term "theories"—to the exclusion of all others. The first calls for a completely orthodox espousal of medical modelling, for the description of a "symptomatology" of drug-use, alcohol-use, tobacco-use "illness", and by extension, a study of the prevalence and characteristics o f spread of those morbid states. Thus the key word for all studies at the ARU was "epidemiology".

The second goal was the establishment of some non-voluntary account of personality. They adopted the behaviourist paradigm and by extension, as a treatment paradigm, behaviour modification by the technique known as operant conditioning. This is, of course, not strictly "medical" but it admitted into the realm of study "personality" in its most passive form. At the Institute it has a special place in the order of things. It is, after all, the college at which the arch-behaviourist Hans Eysenck is professor of psychology. In fact, this type of behaviour modification treatment (discussed below) has been completely unsuccessful in the ARU, not least because there was no one among its proponents who actually understood it.

The third goal, the establishment of a "specialist" enclave, related as it is to the career aspirations of the leaders of the research team, again reflected the disciplinary training of psychiatrists. For the orthodox psychiatrist (the Institute above all can boast of its orthodoxy), asocial genetic predisposition to personality disorder and electro-chemical control of that disorder, provided a logical basis, and on it they erected their edifices of morphinism and alcoholism.

The theoretical corner-stone – Epidemiology

An epidemic is a large-scale, temporary increase in the prevalence of a disease; epidemiology is the study of that prevalence and the characteristics of its spread. Its intrusion into social science and especially into the study of "deviant" behaviours and populations is not an accident. In the light of the success of the techniques in the medical context, it is seductive to believe that apparently intractable activities regarded as "social problems" could be charted and *treated* in the same way.

I have no doubt that many "epidemiologists" will immediately object that in medicine the use of epidemiology has developed beyond the confines of its original use in infective illnesses. It now encompasses, they would argue, a number of conditions where increased prevalence and spread is observed but where infection is not a component. They might even argue that epidemiology now deals with medical conditions which have very distinctive and widely acknowledged social features–heart conditions, ulcers, and so on.

I have to reply that the term "epidemiology" is misused in these contexts, and the misuse has important consequences. Demographers collect data on the prevalence and spread of all types of phenomena in populations–what they tend to call "attributes" of the population–as well as data on population movement. They often collect data on the distribution of people's heights, weights and other factors which also have a close correlation with social and dietary patterns. But because they do so does not make them epidemiologists and it would make no sense to talk of, say, an epidemic of people 5 foot 8 inches tall. Yet medical journals frequently talk of epidemics in the contexts of "overweight". They are using the term in an imprecise and colloquial way.

The words "demographic" and "epidemiological" should not and cannot be collapsed into each other because the latter requires that a particular condition holds, while the former does not. The condition makes the two concepts completely distinct from each other. While it is a sufficient condition of both that they deal with the distribution of quantifiable phenomena, it is a necessary condition of epidemiology that it incorporates an explanatory mechanism to account for the passage of the phenomenon from one individual to another–and this explanatory mechanism is the infective agent. Thus the study of the distribution of coronaries is a demographic study of a social attribute, whilst a study of the distribution of typhoid requires necessarily the explanatory addition of the infective agent.

To use epidemiological terminology when the necessary condition does not hold, far from giving a more accurate or heuristic account, merely hides a social phenomenon within the domain of medical discourse. It distracts us from the social and focuses our attention on pathological and individualistic explanations.

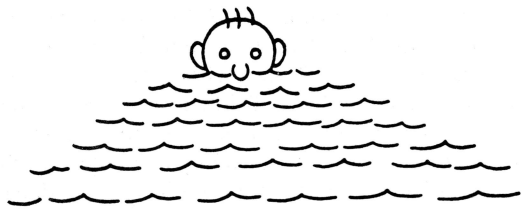
When the use of medical discourse intrudes, many types of social pheno-

menon, however interactive and obviously social they are when we describe their ethnography, have come to be treated as though they were medical "complaints". They are described and dealt with as entities self-limited to specific individuals. In as much as that individual's activities involve others in similar activity, the communication is treated as though it were "infection". If a behaviour can be depicted successfully as a physical ailment, then it can be treated in accordance with the rules of physical medicine. At this point it is often objected that the medical paradigm is only intended as a simile, a means of yielding more illuminating comparisons and models so that scientific discussion is facilitated. There are the usual grounds for proposing a highly simplified epidemiological model. But if this argument were taken seriously, even those who advocate the use of the *simile* must object to it being treated as though it were a statement of the concrete facts about the nature of the phenomenon. The simile is treated as the fact, and there is no objection. Moreover, the doctors who start by advocating the simile end by officially controlling the phenomenon with licence to "treat" it.

When it was suggested earlier that the medical model in deviance was seductive, it should be said that it has actually seduced. There is a tradition in criminology of using explicitly physiological explanatory systems, and the modern outflow of that tradition adds medicine to physiology. The "positive school of criminology", fathered by Cesare Lombroso (but with still earlier roots in physiognomy and phrenology, which came to maturity under the direction of Enrico Ferri in the period between 1870 and the first decades of this century) attempted to describe "criminological types" as physiological families. They systematically calibrated the bones of inmates in Italian prisons, paying little attention to the social and legal reasons for their detention, but proceeding directly from the fact that they were incarcerated. And they demonstrated to the satisfaction of most of their contemporaries that there was a characteristic body type among criminals (Lombroso: 1911). Lombroso finally concluded that: "The study of the causes of crime does not lessen the fatal influence to be assigned to the organic factor, which certainly amounts to 35 per cent and possibly even 40 per cent; the so-called causes of crime being often only the last determinants of the great strength of congenital impulsiveness, the principle cause." (1918)

As few researchers can ever hope to claim to account for 40 per cent of the variance in any form of delinquency by one factor alone, Lombroso's reputation grew understandably large. Indeed, so long as we steel ourselves to ignore factors like social class, it is unlikely that anyone will ever again achieve as great a level of explanation of variance as 40 per cent.

It was in this context that Charles Goring (1913) made his devastating attack on the Lombroso position when he showed that the atavism and degeneracy claimed by the positive school to be correlated with distinct



criminal physical type, could not be shown to be the case at any significant level in large samples of criminals and non-criminal control samples. No characteristic physical differences could be established.

The positivist tradition of thinking was not, however, to be so easily abandoned. A major attempt was made by Ernest Hooton (1939) to revive it, and he went so far as to say that given the physiological type of criminals, the only sound basis for a decisive attack on delinquency and criminality was through eugenics. This attempt to breathe life into the Lombrosian corpse foundered when it came to light that Hooton's control sample, which, with an engaging ideological turn of phrase, he labelled "civilian", turned out to be a hand-picked group of athletes. But even after this debacle, the theoretical cadaver refused to lie down. A final, more sophisticated attempt was made to prove the existence of the natural criminal and the logical necessity for eugenics. To show that there was a philogenetic mutant of *Homo sapiens* with an inherent tendency to break the law, whatever the law happens to be—and even when the law changes—William H. Sheldon (1949) argued that "somatotype" would account for delinquency.

Sheldon has been criticised for vagueness and inconsistency by Don Gibbons in *Society, Crime and Criminal Careers*, Alfred Cohen in *Deviance and Control*, and others too often for a critique to bear repeating here. Suffice it to say that within his "criminal" somatotype—which to put it at

"Well, I'm disenchanted, too. We're all disenchanted."

its most sophisticated refers to "hard, round people"–also fall policemen, firemen and members of other vigorous professions. In our own decade, Professor Hans Eysenck has returned to the fray and, indeed, to proposals for direct intervention by "person-engineering" (1970). Others have tried to modify these physiological models by adding concepts like "natural instinct" (see Jenkins: 1947). Always we encounter explanations which depend on genetic features as causally determinant, and the specific exclusion of other factors, that is, to presocial explanations.

In this tradition, explanation goes far beyond biological simile. An attempt is made to propound statements which are to be taken as descriptions of verifiable reality. It is in this context that we encounter medical/psychological descriptive methods–in the case of Eysenck, quite explicitly–and it is not surprising that they emerge from the framework of entirely physiological models. Thus, when a phenomenon occurs which has characteristics of sudden spread, a model is introduced from medicine which is both explanatory and methodological. The grounds for accepting epidemiology as an explanatory system, or as a framework for research action, are no better than is persisting in the use of somatotype explanations. It is true that in the context of certain drug and alcohol uses, diagnosable illnesses appear, but they give no *a priori* basis for using the epidemiological model to account for the drug and alcohol use itself.

The sociological staff at the Addiction Research Unit questioned sense in using this model, and asked what the implications were for any research results obtained by approaching the issues in this way. We have noted that epidemiological research developed in the examination of prevalence and distribution of illnesses into which could be incorporated–and I have argued necessarily so–some explanation of the mechanism by which the disease spreads. It developed in the context of large-scale, often recurrent increases in prevalence. It used quantitative techniques developed in parametric mathematics to provide data and tests of the adequacy of data. It depended on microbiology to provide knowledge about infective agents and their transmission. In this unacknowledged sense, medicine was parasitic on two other sciences, statistics and microbiology. It is critical, here, to recognise that it was not the use of statistics *per se* that made epidemiology scientific. It was the explanation of the mechanism by which infection was transmitted (the biological connection between two–or more–associations). Descriptive statistical tools made easier, and subject to tests of significance, the measures of extensiveness of the operation of the infective mechanism. It becomes important to spell out the necessary conditions.

It was necessary for scientific description of what was taking place that the mechanism of transmission be explained in order to account for the passage of the same disease entity.

This shows why the question of actuarial technique is secondary. Final, total numbers are generated by counting all individual "cases". We cannot

count a case we cannot see, and to that extent, our counting is conditional on our method of looking. Still more important, it is assumed that all cases we count as genuinely falling in the same category are equivalent, for if they are not, all appropriate cases will not have been counted and some inappropriate ones will have been. The mathematical rules of equivalence, when they are satisfactorily made out, are what allow us to state that each case is sufficiently like another case for them each to contribute equally in arriving at the final total of such cases.

In epidemiology, it was for this reason that a standard set of diagnostic criteria were required (or retrospective criteria at autopsy) in order to recognise a "case". There must therefore be a systematic description of symptoms. Only then is it possible to eliminate from the count those individuals who appear to have some of the symptoms of the illness, but who, by stricter analysis based on all diagnostic tests, prove not to have the infective micro-organism. Part of the test involves the question: is it possible for this person to have come into contact with the infective micro-organism? Thus, while we "catch" a cold, 'flu, smallpox or malaria, is it appropriate to say that we catch alcoholism or heroin addiction in a meaningfully analagous way?

Consequently, it is necessary to have at least a working description of the infective agent and its relation to the symptoms, which must be adequately and accurately specified. The mechanism of transmission, the route of contagion, must be explained, or there can be no grounds for positing equivalence.

Only on this foundation does statistical sophistication and elaborate surveying make sense. And in medical epidemics there have been massive accomplishments in this field by making out these criteria. Such successes have been in the area of infectious illness, where specific types of intervention have resulted, rather than in the study of coronaries or ulcers which, to be accurate, have been studied demographically. It has provided concrete knowledge of the extent of infections, provides techniques for screening, and allows preventitive action to be taken when current and recurrent incidences are detected.

It is precisely in the area of the techniques employed as a result of the substantive knowledge that the paradigm is carried into social science in a dangerous way. Where success crowns medical advances in this field, ideologically unacceptable solutions are imported as "treatments" into deviancy and criminology, for example by validating certain treatments (immunization on the one hand, and quarantine on the other). Clearly, these methods are proposed in the social sciences where social problems are said to exist. "Social problems" are regarded as being as undesirable to "social health" as disease is to an individual. Many phenomena have, at different times, been seen to spread through particular populations, or through particular classes in populations. Fashion provides frequent examples: wearing platform shoes,

Beatlemania, skinhead hair cuts, and so on. And some commentators claim that they appear more or less suddenly, that they are recurrent or cyclical. But the question remains, to what extent can we seriously propose that the epidemiological paradigm holds?

There is no attempt to attack all forms of quantification here, least of all because of the difficulties encountered when we try to count all "problem drinkers" or "cannabis users". Nor is the immediate issue (though it is of great importance in the longer run) to probe what is meant in the hegemonic system of ideas by those labels. Our immediate difficulty is the impossibility for all practical purposes of claiming equivalence between persons on the grounds of an item of their behaviour taken out of its social context. In the case of drug use, with which the ASTMS members in the ARU were concerned, many of the relevant activities were not directly observable. They relied, for detection, on self-disclosure, and there is little basis for claiming that criteria of equivalence exist on those grounds. Indeed, many people only engage in these activities because they can do so in secret. Where the activity occurs in a visible setting, it is often in a highly structured group of relationships, which the researcher is obliged to "ignore".

While we may not know of everyone infected with TB bacilli, methods of screening, the social legitimacy of self-disclosure, and the specific nature of the condition itself, give considerable grounds for optimism about the reliability of statistics. By contrast, with the ingestion of psychoactive chemicals all we do know is that we don't know who is doing what. And what we do see, which has little to do with the possibility of enumeration, we are asked to ignore. In the first case, the entire population infected with the bacilli are likely to regard it as in their interests to be socially visible to agencies who can help. In the second case, the drug-using population almost invariably hide from social apprehension.

But even if we could accurately count prevalence and distribution, and if the paradigm held thus far, the other elements necessary for an epidemiology are absent. There is no *medical* knowledge about transmission. It is hardly a relevant concept. No one claims that alcoholism or "cannabis-ism" are carried by bugs. No one makes out a consistent case that there is some other, undisclosed illness, which underpins these behaviours. Even those who argue that self-administered alcohol is an attempt at self-treatment of an "illness' like depression seldom go on to claim that depression is contagious in the sense that typhoid is. Indeed, there is evidence that whether the patient is seen as an "alcoholic" or a "depressive" or an "habitual malingerer" depends a great deal more on the doctor's diagnostic predilection than on anything the patient does.

However, with all these limitations on making out a sound theory, why is it that the model persists, and is still the cornerstone of papers published by the hierarchy of the ARU? And why should it be a matter of contention that

their staff were not allowed to record their theoretical objections? I imagine that the answer is obvious. The designation "ill" permits the activity "treatment". If the illness is epidemic, it permits screening and isolation. If it involves genetic maladjustment, it permits a variety of engineering projects on human individuals of the kinds that Eysenck has proposed in recent years, and which Hooton proposed some 30 years ago.

There was therefore a fundamental objection of an ethical political character in working within a paradigm which allows the reclassification of people engaged in socially disapproved activities under headings by which medicine can make wholesale interventions in their lives. Thus the hierarchy of the ARU continuously discussed "treatment trials" and methods of "modifying the behaviours" of socially-disapproved people. Many of the staff resisted these proposals as best they could, at first individually and then with considerable collective support. On occasions it meant a refusal to cooperate in passing upward the names and addresses of research respondents in the drug studies, after these respondents had been guaranteed complete anonymity and confidential handling of information by the drugs studies staff.

It will be seen that all the possible situations that can generate conflict were present. Staff were required to work on a bankrupt medical paradigm; to gather symptomatologies, a task for which they were not trained and with which they had fundamental disagreements; to be utterly subservient to medical personnel in what was called a "multi-disciplinary project" and to give up any desire to advance models either from within their own disciplines or amalgamating aspects of more than one discipline. They were asked to inaugurate work which they regarded as having unethical outcomes. For the staff, work conditions become impossible, and they added a final heresy in the face of the demand for their subservience: they involved a trade union.

Behaviour modification

It is necessary to say a few words on this subject, but unnecessary to repeat the now standard criticisms of the behaviourist model. Chomsky (1959) has disposed of it so comprehensively in his critique of B.F. Skinner's methodology that only blind faith sustains its further practice. His principle conclusion, that it is not a theory at all because it cannot be refuted, has never been answered. He showed that if one argues that given stimulus A in the presence of reinforcer B, an outcome response C is predicted, the non-occurrence of outcome C would mean on most theoretical criteria that the hypothesis should be abandoned. In fact, behaviourists simply say that the theory is not disproved, that C should have been obtained and if it was not, then the wrong "reinforcer", B, was chosen and that the hypothesis will hold if reinforcer D is substituted for B. If we fail to get outcome C again, then the behaviourist still will not abandon the hypothesis but will argue for the substitution of D with yet another reinforcer.

And so on. As he may try until eternity since there is an infinite universe of reinforcers, there is, in principle, no occasion when a *conclusion* may be reached that the hypothesis has failed.

This model was, nonetheless, used as an adjunct to the medical model in the ARU. Relatively little human experimentation occurred in the unit other than in the area of nicotine research, although the Institute of Psychiatry and the adjacent Maudsley Hospital could be relied on to help out. The limited experimental work involved a model of direct intervention in modifying behaviour. There was no reason to believe that the people on the lists of users of alcohol (for whom there were plans) or lists of various kinds of drugs users (some of which were asked for) would not be subjected to similar treatment.

There is, of course, nothing new about aversion therapy and behaviour modification, and perhaps fresh alarm rings a little hollow. In the nicotine research section, repeated tests showed that no significant differences, no better results in terms of people giving up smoking, could be obtained by asking them to stop rather than by using electric shock treatment to stop them. But the key problem in this area was—and still is—that so long as it is believed that the behaviour modification paradigm is likely to yield results, and so long as there is refusal to accept that its "theory" has no possibility of standing up, thinking will continue along these familiar if useless lines. The vague possibility offered by medical treatment intervention stunts the

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development of alternative, especially anthropological, alternatives.

As the director of the ARU, Griffith Edwards, was fond of saying, when indicating to his junior colleagues that they were, in his view, crass and inexperienced: "By their fruits ye shall know them" (*St Matthew*, vii, 20). The ARU has resulted in not one theoretical proposition since it started; no advance in the advocacy of treatments beyond aversion therapy and the single case approach of standard psychiatry; no data beyond mundane compilations of numbers of a most unreliable kind; and no propositions of data on interactive processes.

Medical Careers

In an organisation structured to promote the careers of senior members of staff, where there is a subordination of other purposes to this function, it is necessary to ask many questions. What is the nature of the specialisation which the hierarchy has inaugurated, and in which it is proclaimed "specialist"? How is such self-definition facilitated? What is the ideological function of identifying certain people as deviants of particular kinds and what role does this entitle the "specialist" force to adopt in terms of normalisation of these deviants? What happens to competing accounts of these same phenomena? Is plurality of view a possibility or is hegemony inevitable? Are the methods of research directed toward sustaining and strengthening the ruling ideology and structure, or are they relevant as a means of approaching the phenomena themselves?

The mode of organisation required to undertake the type of exercise engaged in at the ARU is itself worthy of study, but some tentative thoughts may be expressed. Of all the emerging areas in which a psychiatrist might make a name for himself, few currently offer the opportunities available in studying deviance as a criminological subject. There are, after all, any number of psychiatrists studying and treating those defined as mentally ill. The wider vistas, with less competition, have unquestionably appeared in medicalising those activities which are socially disapproved. Every kind of misfit, from shoplifter to homicidal bank robber, falls within the medical overview as doctors are asked to "cure society's ills". It is now a matter of form to call for a psychiatric report during a criminal proceeding, and whole new domains of medical expertise are being added to the more established candidates like drug-users and heavy drinkers. Any criminal act committed by a woman, tax evasion, baby battering and failure to pay traffic fines, are to be regarded as evidence of mental illness, as acts flying in the face of normality and nature. Women's prisons are to be metamorphosed into psychiatric hospitals, warders into nurses. It is easy to see some of these changes, in some respects, as humanising the penal system, but the ideological outflow is clear, as is the added scope given to prison authorities. They may now treat people, on a standard basis, with sedatives and other

drugs as a method of social control. Ideologically, some activities, especially those regarded as opposing the current social order, are to be redefined as features of individual pathology, and treated as such.

We have noted that among the "deviancies", alcohol and drug use suggested themselves early on as possible psychiatric specialist areas. They have, indeed, provided prestigious career possibilities, particularly since the establishment of the Drug Treatment Clinics in 1968. Channels for upward mobility were provided to a new elite group of psychiatrists, and the notion that there was a substantive field of research which could inform their practice developed a new momentum. Their careers were consolidated as practitioners and research scientists. They severely limited the criteria for "real" knowledge, and have maintained these boundaries very effectively. Allowing damage to these quasi-theoretical boundaries has been correctly identified with allowing damage to take place to the career structure. What room is left, after all, to the doctor who applies leeches when it is no longer accepted that they cure smallpox or hernias?

The possibilities of making some radical anthropological assessment of the field of psychoactive chemical use, the attempt to set it in the context of social interactions of a varied kind, had to be entirely excluded at the ARU. To admit it would have been to erode boundaries and to challenge the hegemony of the ruling discipline in a way that was both immediately dangerous and also open-ended: who could say where such a process might lead? The consequence was clear for the psychiatrists. At best, their designation as "the specialists" would have been replaced by the idea that a number of disciplines were providing a specialist core. Rather less acceptable, another discipline might take over the hegemony. At worst, these new researches might have swept away the very idea of a specialist area by dismissing the concept that a particular behaviour, taken out of context, could be regarded as "deviant" at all. The psychiatrists correctly identified such a programme as destructive of their career structure. The present incumbents would have been left stranded, for to move back into other areas of psychiatry would be a clear relegation.

In those circumstances it is not surprising that they fought so hard for total control, that they should have depreciated and sabotaged every effort in the drugs research area made by social scientists on the pay-roll. The contradiction, as far as the medical establishment was concerned, was that they could only raise research funds by employing social scientists, but once employed, these same social scientists had to be isolated from decision-making and their work had to be either co-opted or destroyed. And additionally, the social scientists had to accept the deferential, subservient roles that are accepted by junior members of the medical profession, employees who are well-known, as a group, for their adherence to a pecking-order. The few who did accept it, mainly in alcohol research, were admitted as junior and highly patronised members of the ruling social "set", as is the junior

house doctor who shows sufficient deference to his consultant. But to connive in such a situation was, inevitably, a stumbling block for the majority. To curry favour would have involved not only a willing complicity in seeing sociological and social psychological work systematically sabotaged; it would have involved not only nauseating obsequiousness; it would have involved compliant agreement in designating particular people as "ill" and leaving those people to face the consequences. It would have involved acceptance of "individual pathology" as the sole explanation, and the total absence of any explanation related to social conditions. Thus, although an overwhelming proportion of the people known to the authorities as "alcoholics" are working-class Irishmen and Scots, any explanatory system that began to unravel that phenomenon, or even to unravel the reasons why middle-class heavy drinkers so often manage to avoid public notice, was out of the question. It remained "coincidental" that the known "alcoholics" were Scots, Irish or working-class. The only salient factor was that they were "ill". Analagous social factors in the field of drug use were equally ignored.

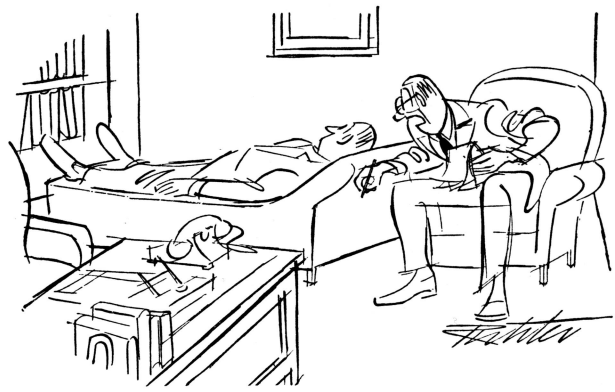
Complicity in the definition involves tacit agreement about what should happen to individuals so defined. The only sensible purpose in designating someone as "ill" is that they receive "treatment". It is churlish to take the first step and claim to be too fastidious to take the second. All in all, the consequence of medical elitism is not simply the wounded pride of social scientists, but collusion in ethically and politically unwarrantable actions.

This configuration of conditions gives rise to specifiable constraints on research methodology. If it is desired to isolate individual behaviour within concepts of pathology, and to exclude constructs which locate the behaviour in the structure of a social field, it is necessary to employ methods that cannot produce findings that give weight to social structures. A researcher must be steered, or ordered, away from any model which interrelates facets of individual and social action. There must be a systematic fragmentation of the corpus of social information about the individual. The blanket survey is a method *par excellence* for accomplishing this end. The ARU directorate chose it every time, just as social structuralist (as in the work of Levi-Strauss or Althusser), interactionist (as in the work of Goffman, Cicourel and others) and political-economic (as in Marx and Lenin), were always rejected. The survey was to assist epidemiology. Since the paradigm which would have justified its use did not hold, its employment must have been to serve another purpose.

The argument in the ARU was posed, at first, in terms which did not raise the fundamental ethical/political questions. It was argued by the drugs researchers that there should be a thorough theoretical reappraisal and an end to total emphasis on piecemeal data collection. This view was rejected as "time-wasting" when there were so many "diseased" people in need of help, desperately waiting for treatment. The paucity of even a substantive

medical model produced a configuration recognised by Wright Mills (1943): "Such an approach is then sanctioned with canons of what constitutes real knowledge; the practice of the detailed and complete empiricism of the survey is justified by the epistemology of gross description. These norms of adequate knowledge linger in an academic tradition to mould the work of its bearers. The emphasis on fragmentary, practical problems tends to atomize social objectives. The studies so informed are not integrated into designs comprehensive enough to serve collective action, granted the power and intent to realize such action." It is in this conjunction that the "scientific activity" of collecting "facts" about drug users in a way that denies their social existence, because it is "for their own good"—that is, for the moral good of the social order, comes together with the pursuit of a medical career. The amalgam fits with remarkable neatness into the goals of bourgeois order.

For the productive drugs studies staff of the ARU in such an extreme set of circumstances, every one of the conditions of conflict existed. (1) The



"Why, you swine!"

staff were deprived of their means of producing scientific work. (2) They were colonially governed by medical imperialists of the most backward kind, from medicine's most conservative academy. (3) They were instructed to carry out tasks best described by the repressive jargon in which they were couched. The directorate was the direct heir of the director of the Hôpital Général in Paris, described by Foucault (1967), who quotes a document of 1656, stating that the director had "all power of authority, of direction, of administration, of commerce, of police, of jurisdiction, of correction and punishment over all the poor of Paris, both within and without the Hôpital Général." Thus all that was needed at the ARU to transform a potential dispute all of whose elements were present and simmering, into an active dispute, was provided by a series of events, in which three stand out.

"ASTMS–OFFICIAL PICKET IN DISPUTE"

First, the directorate brought forward a "research" project proposal in which the drugs staff were expected to co-operate. A variety of piecemeal information was to be collected, not on the basis of any discernable theoretical programme, from within the recesses of the London "drug scene" and given to "the appropriate authorities". These data, as anyone could see, would lead the appropriate authorities right back to its sources, that is, to the users who had helped the "researchers". Since the only appropriate authority is the Home Office who control the police, there was an immediate and strong objection to becoming an intelligence arm of the Drug Squad. This project, the directorate called "The Intelligence Network Project". Despite vigorous objection, they hired a young psychiatrist with good connections in what was known as the "underground" to set the enterprise up. It took him a matter of days to see what was expected of

him, a couple of months to try to change the project into something both scientifically valuable and ethically sound. He was blocked at every turn and finally walked out.

Second, a research proposal which took serious account of social structure and which sought to identify how individuals develop their systems of beliefs and attitudes in a group structure, was proposed by two social scientists and vetoed. The principal researcher in this team, who was at that moment receiving his doctorate for a part of the work started at another university, and who has taken the same method to a different project at Bristol University with outstanding success, was fired by the director as "incompetent". The fact that he was a local ASTMS representative and responsible for recruitment in the ARU was said to have had nothing to do with the decision.

What stands out in this episode, where there was quite explicit objection to his union activity, was the way in which this researcher's "incompetence" was presented. Apart from allegations about the abruptness of his personal style, it was said that the methods he proposed to use were untried, contentious and unlikely to work. None of this was the case—the basic methods had been tried in the United States with great success for some years. But more to the point, they were predicated on the assumption that communications between people are conducted socially, and that they contain expressions of beliefs held by people constructed by them in groups, and showing wider ideological content than simple views about "drug use". Although this does not seem to me to be an outrageously revolutionary proposition, it was treated as though it was a declaration of war.

Third, there were important suggestions that a group of cannabis users who had cooperated in one study should be identified to the directorate so that they could be asked to take part in experiments involving air encephalogram measurement of their brain spaces. Resistance to providing the names of research respondents who had originally talked to the researchers on the assurance of complete confidentiality and anonymity was viewed as obstructive. The researchers received official warnings about their future conduct. The point of this piece of research was also clear. Since the "cannabis-leads-to-heroin" thesis was in a state of collapse, it was decided that we should establish that users became brain-damaged. The spaces in their brains would be larger because of loss of brain cells as a result of using cannabis if they were compared with "normal" people. It is not hard to imagine what types of intervention in their lives would be permitted if they were to be regarded as brain-damaged zombies.

It was clear by August 1973 that the conditions of work had become intolerable and that no amount of internal discussion was likely to resolve the difficulties. The drug staff were consolidating their union recruitment; some members of the alcoholism staff were known to check that the corridors were empty before even venturing to the toilet, the rest of the

time hiding from everyone in their rooms. Indeed, when the drug staff of the ARU sought to meet the directorate in early September, they were told that no meetings could take place. They would be regarded as attempts to usurp the authority of the director, Griffith Edwards, as had been a discussion the previous February when the whole staff had urged changes in the organisation. Curiously, from August on, there were no statements from the directorate to indicate what any of the staff should do other than refrain from usurping the director's authority. However, everything they did do, they would be immediately told was unacceptable.

The drugs research staff then sought a discussion with the head of the department, Professor Sir Denis Hill, who listened to what they had to say about the situation and told them that they had officially raised a "Grievance", although he didn't take the view that grievances on scientific questions could be raised. Immediately after he had seen them, he informed the management committee of the Institute that he had a grievance against the research staff–namely that they had a grievance of a serious kind against Dr Edwards and were, thereby, seeking to "overthrow his legitimate authority". Although this terminology might have sounded more in keeping had it come from the mouth of an executive of the United Fruit Corporation in a banana republic, the committee of management immediately took dramatic action. The dean of the Institute saw the staff, again listened to them, and then took the view, not surprisingly given his terms of reference, that everyone involved was clinically paranoid. He then produced a piece of paper stating that those who signed it would have promised never to repeat outside that room that he thought the whole ARU personnel were manifestly mad. He asked everyone to sign it. By this stage, the research staff felt they had no option but to take a step of unparalleled temerity in the history of the Institute. They asked the full-time official of the union to negotiate on their behalf. The effect was like aerosol spraying "Free Abortion on Demand" on an inside wall at the Vatican.

The Institute set up what they termed an "independent" committee of inquiry which was, in fact, a sub-committee of the committee of management of the Institute. The chairman of the committee of management, a High Court judge (who must therefore be "impartial"), Lord Justice Ormrod, chaired the hearing, where he refused to recognise the union and thus impeded its right to negotiate for its members. He said he would entertain no arguments about how the hearing was to be conducted and insisted on tape-recording every word. The full-time official thought, and the members concurred, that no useful purpose would be served by remaining. As they left the room, followed by shouted threats as they reached the door, that they had come to the end of the road, they were relieved that the judge couldn't put on a black cap and pronounce the death sentence. But what he could do, and did, was to hear Sir Denis' complaint against the staff, albeit in their absence. The hearing lasted almost four minutes.

The outcome was hardly in doubt. The Institute asked the research staff to do the decent thing and resign. When they declined to do so, they were dismissed. With over 60 colleagues in technical and academic grades they went on strike, and in the context of the dispute being made official, more or less closed the Institute. It was one of the longest disputes ever engaged in at an academic institution, and through the late spring of 1974, like a monument to the event, piles of rotting waste and animal carcases from the experimental units piled up around the Institute. There was a picket from 5.00am to 8.00pm every day, and support from other unions was magnificent. The General and Municipal Workers, whose members were local dustmen, told the Institute that if they brought in private contractors to remove the rubbish, then all the refuse from Southwark would be tipped on the front doorstep.

In late July, a year after the trigger point, there was agreement to take the case to an Industrial Tribunal. Although the ARU staff involved were not happy with the proposal, the bulk of the ASTMS membership, technical staffs, believed that it might offer a solution. As generally used to happen before the introduction of the Conciliation and Arbitration Service, the tribunal's findings were against the staff. While the tribunal could agree that the ARU Drug Section was no longer viable as a work unit, and while the staff had many points with which it agreed, it was impossible to conceive of a situation where the parties involved could happily work with each other again. The staff should therefore accept this situation and go. Sadly, though inevitably in that setting, the opportunities to argue out the underlying scientific questions in the dispute were absent. Sadly because there was no public presentation of the ideological issues involved in this type of "scientific" conflict. Sadly because an opportunity to give a widespread account of the purpose of organised social research in a medical establishment was denied.

Conclusions

Industrial disputes tend to focus down to a traditional core of problems for the trade union movement, in the case discussed here issues of recognition and of the right of newly-unionised sectors to ask for union representation on conditions of work. The consequence of the above events was that both sides of the dispute lost, however complacently the management might regard the tribunal finding as a victory. The medical mould was not broken by the research staff, and it will continue to enjoy a prestige out of all proportion to its accomplishments and shielded from attack on its political purpose, until some far stronger contingents join the fight. The blows currently being struck at the consultants in the Health Service by the manual unions and by ASTMS may assist this movement, since the medical hierarchy is beginning to appear publicly as what it really is: career and

money obsessed. The management lost because they could not sustain their prestige drugs research section, on which more than a third of a million pounds had been lavished, as an operating entity. It collapsed, and the bulk of the research was lost with those who had conducted it. Its current contributions to conferences and learned journals, if there are any, have escaped detection by those still active in the field.

In summary, there are a variety of options open to academic staff faced by an establishment management who undermine their ability to enjoy reasonable conditions of employment. Most of these options are self-defeating; they require resignation or dismissal of dissenting staff. Even where discussions take place on academic freedom, this is the likely outcome. There is, as Professor Eysenck was absolutely correct to say, no such thing as academic freedom for anyone below the level of Professor. Unless one is fortunate enough to be in an unusually progressive department, power relations are such that those who enjoy freedom are those powerful enough to demand and retain it. This applies with equal force to the conduct of research and the framework in which it is interpreted, not just to questions of choice of topic and problems of who does what.

For most staff, their subordination in the department and the challenge which their work may pose to more senior members–and of course, the order which the senior members often openly serve– will mean that as individuals, they have no personal leverage worth talking about. Their ability to wield power requires that they build a power base of their own. And that involves, as it has through history, combination. The sooner it is generally understood that different conditions of work prevail in different sectors, but that this does not make the academic different from other work people; that many "personal" problems are quite common among fellow workers and that these fall into the province of conditions of work; that considerations of status disappear sufficiently to allow members of the same departments to compare salaries, hours of work, rights in relation to the employer, factors seldom discussed because they are seen to be private; then the sooner will a powerful trade union constituency be put together.

Those who feel that academic life is not in any way made up of the more common stuff of management-worker relations may well, of course, survive. They may do very well for themselves. They should understand that it is specifically at the cost of their integrity, and that they stand in the way of progress toward socialism. The freedom they claim to enjoy is the freedom to maintain the social order. But for those who shake these bedrock assumptions, they had best learn to live without an obsession about individuality, and raise an umbrella over their heads to deflect the debris that will certainly rain down.

Notes

1. I have deliberately excluded the Association of University Teachers (AUT) from the list of unions. It is only now (June 1976) in the process of applying for TUC membership, and in the context of the Institute of Psychiatry dispute had a role clearly on the management side. It is far from uncommon for an academic work force in a dispute to find the AUT acting as an arm of their domestic management and to recognise that local AUT leadership and college hierarchy are one and the same. It is to be hoped that this situation will change.

   In the Institute case, all relevant staff in dispute resigned from the AUT, an organisation of which they were members because it negotiates academics' salaries at national level. That these staff were also members of ASTMS was a quite realistic reflection of their expectations of AUT activity when the dispute started. The AUT acted consistently to destroy the strength of the strike.
2. There are enormous problems in the credibility of statistics which are said to reflect enormous growth in drug use, since total numbers are as likely to reflect factors involved in how the count is made as much as the attributes of individual users. (See Cicourel, 1964; Hindess, 1974; and Triesman, 1974).

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Patrick Parrinder

The black wave: science and social consciousness in modern science fiction

Fifteen or twenty years ago, science fiction had a very clear-cut social identity. Writers saw their books as simple escapism or as part of a serious, educational effort to aid technological progress and recruit future scientists. (Some individual exceptions to this will be mentioned below.) The audience consisted mostly of adolescents and young adults with a pronounced scientific and technical bias. For many, science fiction represented a prolongation of pre-adolescent reading patterns, such as those acquired from the comics. SF offered escape from the pressures of maturation into an exotic man's world where emotions and feelings were terse and utilitarian, and sexuality was almost entirely latent. This social identity was reflected in the fan-clubs and conventions, which form a typical example of an organized youth sub-culture.[1] Science fiction of the "Golden Age" (say 1940-1960) was characterized by technology-worship and by an implicitly sexist attitude, summed up by Sam J. Lundwall when he wrote an essay on "Women, Robots and Other Peculiarities".[2] While the readership has, one would suppose, remained predominantly male, science fiction today is undergoing far-reaching changes. Distrust and suspicion of technology have become commonplace in SF novels in the last ten years, while sex and—occasionally—feminism have come to the fore. The audience has certainly become more diverse: among students, for example, SF is as popular with those taking arts courses as with scientists and technologists. At the same time, it is increasingly recognized as a force in culture. Some would say that it is becoming "respectable" (in other words in the academic vogue for science-fiction studies) but it also possesses increasing social and political awareness.

Even at the height of the Cold War, science fiction did not always live up to its reputation of presenting the scientist-hero in an automatically respectful and reverent light. Writers are now very conscious of probing the social consequences of science and technology and of exploring the assumptions and limitations of the scientific outlook. As a result, SF has acquired a distinctly radical and "underground" appeal. It can now be seen as potentially—though only to a limited extent in practice—a subversive literature transcending the values of contemporary society. The present essay offers a brief outline of literary and ideological developments in the SF field, together with an examination of three contemporary novelists whose work seems to me of particular interest. A convenient starting-point is the distinction between "hard" and "soft" SF, which has become one of the commonest reference-points for writers and critics.

"Hard" science fiction is concerned with extrapolation from current discoveries in the physical and biological sciences. The emphasis is on the engineering applications of these sciences. This is the basis of the Anglo-American pulp tradition, which is usually traced back to Hugo Gernsback, the inventor of the term "science fiction" and founder of the magazine *Amazing Stories* in 1926.[3] Gernsback was an editor who felt that the quality of the stories he published was less important than getting the right image. He was a naive gadgetry-enthusiast, the promoter of magazines with titles like *Modern Electronics, Air Wonder Stories*, and *Science and Invention.* The history of American science fiction since 1930 could be viewed as a gradual dilution of Gernsback's injection of technological fetishism.

"Soft" SF is more difficult to define than "hard", because it is usually seen as a reaction away from what Gernsback represents. Evidently there are various stages through which such a reaction can pass. The first involves a movement from the physical to the social sciences and from engineering to more speculative extensions of theory. Then there is an increasing concern with human relationships—the major preoccupation of literature as a whole. Lastly, all connections with the reasoning and methods of science may be severed, so that scientific ideas become the marginal—and magical—accompaniments of an exercise in pure fantasy. My view would be that when this happens, science fiction becomes something else, in all probability of less interest. But I would add that "science" ought to be understood in the wide and not in the narrow or typically Anglo-American sense. Sociology, anthropology, psychoanalysis and ideologies such as Marxism are as much in the domain of science fiction as are lasers and the laws of thermodynamics.

Hugo Gernsback's role in science-fiction history was mainly a symbolic one. A much more active influence was John W. Campbell, the writer-turned-editor who took over *Astounding Stories* (later *Astounding Science Fiction*) in 1937. *Astounding* became the leading pulp magazine, and many

of the best-known older writers such as Isaac Asimov, A.E. van Vogt, Robert Heinlein and Theodore Sturgeon first appeared in its pages. Campbell demanded a clear and logical presentation of the scientific content of his stories—this worked in favour of so-called "engineer's fiction". But he was also a much more literate and wide-ranging editor than Gernsback. His stable of writers offered a systematic exploitation of the various categories of story pioneered by Jules Verne, H.G. Wells and others in the nineteenth century—time travel, space travel, the alien invasion and other environmental menaces, the rebellion in the city of the future—together with the exploration of new concepts such as robots, mutants, cybernetics and nuclear physics. Writers were encouraged to pursue speculative and sociological approaches, often of a most reactionary kind. Some of the best-known stories are those dealing with future social history. To take two examples, Heinlein's "The Roads Must Roll" (1940) shows the suppression of wildcat strikes in the automated city, with the author aggressively on the side of the bosses. Asimov's *Foundation* trilogy (1951-3) chronicles the decline of the intergalactic empire in a series of melodramatic episodes held together by a Spenglerian philosophical overview. The values these writers endorse are a fusion of old-style frontiersmanship with twentieth-century technological elitism.

The Marxism of the thirties and forties seems to have had no significant impact on American science-fiction writers. In the nineteen-fifties, during and after the McCarthy period, a consciously liberal school of writers emerged. SF, with its combination of socio-political interests with non-realistic settings, became an ideal escape-valve for the expression of nonconformist longings. Frederick Pohl and C.M. Kornbluth's story *The Space Merchants* (1953) reveals a future dominated by advertising, the big corporations and neocolonialist exploitation, but the hero's concern is with personal survival and the social message is essentially half-hearted. Much the same might be said of Kurt Vonnegut's *Player Piano* (1952).

The failure of SF as social criticism in the fifties is evident from an examination of a book of essays edited by Basil Davenport, *The Science Fiction Novel: Imagination and Social Criticism*, which appeared in 1959. Among the contributors, C.M. Kornbluth argued that its effectiveness as social criticism was greatly overrated; even a novel like George Orwell's *1984* was, he thought, a failure in terms of propaganda. Robert Heinlein took the traditionalist line and praised SF as a Darwinist survival kit which was "preparing our youngsters to be mature citizens of the galaxy." Robert Block, the only truly dissenting contributor, pointed to the ironic nature of the whole problem the book had posed:

> "Most social criticism in science fiction novels is not directed against present-day society at all, as we may previously have assumed. Our authors, by and large, seem to believe wholly in the profit-incentive;

> in the trend to superimpose obedience and conformity by means of forcible conditioning; in the enduring liaison between the government, the military and scientists and technologists: in Anglo-Saxon cultural supremacy, if not necessarily outright 'white supremacy'; in the sexual, aesthetic and religious mores of the day. Their criticism of the totalitarian states they envision is merely a matter of degree . . . . When a literature of imaginative speculation steadfastly adheres to the conventional outlook of the community regarding heroes and standards of values, it is indeed offering the most important kind of social criticism—unconscious social criticism."

There is very little in the three decades of the pulp tradition that steps outside this ideological role. Kornbluth, however, had claimed that social criticism, conscious or unconscious, was far outweighed by the unconscious Freudian material that the writers used. Freudianism was only one aspect of the "mythicization" of science-fictional themes which was perhaps the really significant trend of the nineteen-fifties. A famous example of this is Arthur C. Clarke's *Childhood's End* (1953), where the benevolent Overlords who bring material happiness to Earth are made to suggest a race of Miltonic devils, and the ultimate directing force in the universe is a God in which man can glimpse the possibility of mystical, symbiotic unity. The incorporation of mythological and archetypal themes in SF was a mixed blessing. Probably all major literature contains such themes, which link it to the legends and values of peoples and so to the bases of human community. But in *Childhood's End*, Clarke seems to give way to a traditional religious symbolism which bypasses human agency and has nothing to offer mankind. This may be meant ironically; the story is prefaced by the declaration that 'The opinions expressed in this book are not those of the author.' But Clarke, who is an odd mixture of engineer and mystic, does not seem to know where he stands.

Walter M. Miller's *A Canticle for Leibowitz* (1960), by contrast, embodies an orthodox Roman Catholic outlook. The plot of this book, which is one of the best-known "post-catastrophe" stories of the nuclear age, culminates in a Christian miracle experienced by the two-headed mutant, Mrs Grales. Miller's portrayal in the earlier part of the novel of a Catholic monastery in the coming dark ages which produces illuminated copies of a twentieth-century wiring diagram leads to a view of history cycling round and round again *ad nauseam*. Less backward-looking in its exploration of the relations of science and religion is James Blish's intellectual thriller *A Case of Conscience* (1959). Blish's hero, a Jesuit priest who spends his leisure hours studying Joyce's *Finnegans Wake*, is at the opposite pole from the horny-handed scientists and space pilots of stereotyped SF. The story concerns the discovery of a planet enjoying perfect social harmony and paradisal innocence. For Father Ruiz-Sanchez, this can only be a mirage created by the devil; for

his fellow-scientist Cleaver, however, the place is a perfect thermonuclear arsenal. One of Cleaver's experiments, based on faulty equations, blows the planet up at the very moment when Ruiz-Sanchez is pronouncing the rite of exorcism over it.

In a subsequent essay, Blish defended the use of religious themes in science fiction on the grounds that every aspect of man's heritage would affect our future.[4] But religion had a more specific function than this in his work and in that of Miller and Clarke. It provided a detached and ironical framework for their portrayal of the irredeemably fallen state of man, the futility of progress and the destructive nature of the pursuit of knowledge.

Mythological fantasy, literary allusion, and technological despair were all features of the best liberal science fiction of the nineteen-fifties. The critic Damon Knight reinterpreted the initials SF as "speculative fiction"—a label which has become increasingly fashionable. In the sixties, however, the onslaught of the New Wave school of writers led to a sharp polarization between experimental and traditionalist fiction.

The "New Wave" saw SF as an alternative, underground literature, using space travel and the "parallel world" as transparent analogues for psychic and social processes. Outer space, they claimed (at about the same time as man was landing on the moon) was really only a metaphor for "inner space". New Wave writers looked on technological progress as fraudulent or irrelevant, but regarded artistic experiment as essential. They identified with the youth movement and set out deliberately to attract a new audience. SF became a hippy cult in America, but the new movement of writers centred on the British magazine *New Worlds*, edited by Michael Moorcock.

It is difficult to be objective about the "New Wave" in retrospect. On the credit side, they certainly eased the publishing situation, so that stories with subversive and experimental content could find a ready outlet. The best-known New Wave writers, such as Brian Aldiss and J.G. Ballard, produced some remarkable books but have recently shown a disappointing failure to develop as they had promised. Ballard's torrid exercises in the "imagination of disaster" have become quite peculiarly repetitive.

Certain other features of the New Wave belonged more to a publicity stunt than to a genuine outburst of subversive art. Their parade of literary sophistication spoke of a "new world" of cultural *chic* and Arts Council sponsorship, rather than new frontiers of the scientific imagination. Michael Moorcock boasted in his preface to Langdon Jones' representative anthology of *The New S.F.* (1969) that the visionary impulse had "become more sophisticated since the days of Wells and Huxley." One aspect of that sophistication was evident from a later comment in the same preface:

> "These stories are neither particularly Utopian nor Distopian and I would judge that if the authors look to the future at all it is the expectation that the future will provide a growing audience for their work."

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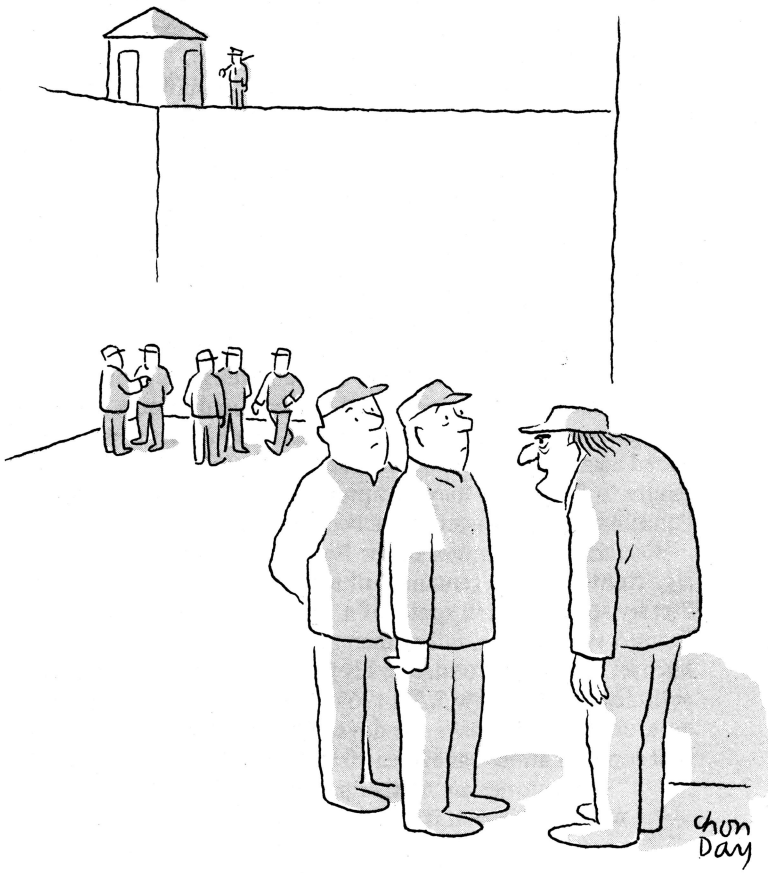

"I can turn you into a bird, but you will have to remain a bird."

Opportunism—masquerading as a rejection of "outdated" conventions in SF—could not go much further than this.

The New Wave as such has now spent itself, and it is easy to pick out its faults. Whether inspired or absurd, it helped to establish a new generation of writers who are changing science fiction profoundly, not by being indifferent to the future, as Moorcock suggested, but by creating wider horizons for it. Among the best of these writers are Ursula le Guin, John Brunner, Samuel Delany, Philip Dick and Thomas Disch, some of whom were associated with the New Wave, and some not. Other recent developments are contributing to the final emancipation of SF from its domination by adolescent technological fetishism. These are the rediscovery of European science fiction, both in the pioneering phase of a century ago and in the works of a contemporary master such as Stanislaw Lem; the revival of interest in utopian fiction and speculation; and the signs of convergence between SF and "mainstream" fiction. The works of contemporary writers such as William Burroughs, Thomas Pynchon, J.L. Borges, Kurt Vonnegut and the later Vladimir Nabokov are often poised between the conventional and science-fiction categories, although among these only Vonnegut has written for the pulp magazines.

The experience of the New Wave suggests that there is no need for premature euphoria about all this. The signs of reaction against the realistic mode in fiction are very widespread, but this may be no more than temporary. Science fiction has benefited from this reaction, but so have other sub-genres such as the fantasy and the thriller. There is always a danger from cultism—as in the strange vogue of Robert Heinlein's novel *Stranger in a Strange Land* (which had a sinister effect on Charles Manson and his followers), or more recently of Erik von Daniken.

Any serious exploration of the modes of non-realistic fiction is bound to come up against the crucial distinction between science fiction and fantasy. What is it that distinguishes a liking for today's science-fiction writers from an enjoyment of J.R.R. Tolkien or of *Watership Down*? Roughly speaking, we may say that both science fiction and fantasy involve the transcendence in the imagination of the existing social and "natural" order. But this is only valuable where the transcendence involves a consciousness of the effort and struggle necessary to achieve it. SF possesses this awareness of struggle through its dependence on the intellectual and cognitive outlook of modern man. The writer has to justify each step that he takes in the creation of his fictional "parallel world". In political terms, this concern with the process of construction of a parallel world can be used to invite the reader to conceive of what would be involved in struggling for a better world for himself.

Fantasy, on the other hand, offers the results of transcending the existing order without any of the struggle to attain it. In pure fantasy, time is abolished, the causation of events is magical or absurd and consequently

everything is possible. The result in most cases is an unthinking replication of contemporary ideology. It is true that a great deal of bad science fiction shares this characteristic of fantasy. But the connection of SF with science in the broad sense (that is, with rationality) makes it a more disciplined and critical form of imagination—and so potentially a more radical and subversive one. The present-day cult of fantasy has made the drawing of a distinction along these lines a matter of some urgency. This urgency seems to be recognized, since the historical origins and logical parameters of science fiction have come in for intensive discussion. And where literary interest in the genre was once associated with conservative intellectuals such as C.S. Lewis, Kingsley Amis and Robert Conquest, the new criticism of science fiction has swung notably to the left.

One aspect of the recent politics of SF was highlighted by Richard Lupoff in an article in *Ramparts* for February 1972. He reported on two paid advertisements by SF writers for and against the Vietnam war, which appeared in the *Magazine of Fantasy and Science Fiction* and *Galaxy Science Fiction* in 1968. The supporters of the "war" ad were all traditionalists such as Campbell, Heinlein, Poul Anderson, Sam Moskowitz, L. Sprague de Camp and Jack Williamson. Younger writers with New Wave affiliations were unanimously in the "peace" lobby. Lupoff suggested, not surprisingly, that this split between hawks and doves corresponded to the distinction between "hard" and "soft" SF which I discussed earlier. What was notable, however, was that he took it for granted that the "hard", reactionary writers of "engineer's fiction" would be social optimists, while the radical writers were anti-utopian pessimists. This impression was largely an accurate one. Yet it is a very odd situation in which the tradition of utopian optimism is western thought has come to seem the natural inheritance of right-wing hardware specialists, behaviourists and futurologists. The utopian impulse, and the awareness of how temporary and man-made conditions frustrate that impulse, are the main links between science fiction and classical left-wing thought.

Two veteran socialist critics who have discussed the utopian affiliations of the genre are H. Bruce Franklin in *Future Perfect* (1966) and Donald A. Wollheim in *The Universe Makers* (1971). Of much greater importance, however, is the work of various critics who have recently become associated with the journal *Science-Fiction Studies* (founded in 1973). Some of these are themselves SF writers and editors (Ursula Le Guin, Stanislaw Lem, Franz Rottensteiner, Joanna Russ), while others are literary critics and theorists such as Fredric Jameson, Robert Scholes and Darko Suvin. There is little unanimity among these authors, but they have been responsible for some lively debate on the relations between science fiction, Marxism and cultural theory.

Some recent critics see science fiction as the expression of a static "philo-

sophical apocalypse", creating new worlds whose mere existence helps to change our ways of seeing. Others would grant it a more active and positive ideological role. Robert Scholes in his book *Structural Fabulation* (1975) starts with the assertion that structuralism, the study of the conventions through which we symbolize and interpret reality, is the major intellectual revolution of our times, and then deduces science fiction as the branch of literature most adequately embodying the structuralist attitude. This is *a priorism* with a vengeance. David Ketterer's *New Worlds for Old* (1974), though a more empirical work, defines SF as an apocalyptic genre exploring a central experience which is akin to religious conversion. Both writers take a highly contemplative view and are significantly vague when it comes to defining what exactly science fiction is (why *science*, after all?). They are clearly responding to the mystical and visionary elements in SF which I have discussed above.

More politically-minded critics tend to look on these elements with some suspicion. Fredric Jameson, for example (more widely known as the author of a study of Marxist literary theory, *Marxism and Form*) argues that there is an urgent need for ideological analysis which would expose even those science-fiction stories generally taken to be radical as semi-emasculated products of the "culture industry". [5] There is, however, a crucial distinction between the analysis of stories whose intention is explicitly or blatantly propagandist, and the exhaustive attempts that Jameson has sometimes made to reconstruct the ideological bases of books like Brian Aldiss' *Starship* (titled *Non-Stop* in UK), where the writer's intentions do not seem to have been political at all. The extraordinarily sophisticated literary armoury of a critic like Jameson seems wasted on such material. There may be nothing wrong in surrounding a simple narrative accessible to any literate adolescent with thousands of words of highly specialized commentary; but when such commentary is not even appropriate to the material in hand (as I think was the case) one suspects that this, too, is an effect of the "culture industry" or its academic counterpart.[5] The sense of uneasiness aroused by the more esoteric varieties of critical interpretation has recently been expressed by the novelist and critic Joanna Russ, who sees SF as a didactic literature concerned with explicit scientific ideas and propositions.[6] This is a valid corrective to the danger of academic criticism running riot in a hunt for hidden symbols, imagery-patterns and systems of ideological values.

Among the current critics of SF the one who has most to offer is, in my view, the Yugoslav emigré Darko Suvin. Suvin's Marxist approach combines an affiliation to the disciplines of the natural sciences with a belief that SF may be understood as the logical, though temporarily inverted, successor to the utopian aspirations of nineteenth-century socialism. From his materialist standpoint he draws sharp distinctions between science fiction and fantasy, and denounces the fashionable idea of SF as "new mythology". At

the same time, Suvin defends utopian imagination and thought against the hostility it has traditionally provoked in the Communist movement. Engels' treatise on *Socialism–Utopian and Scientific* was a vindication of Marxism against the French utopian socialist doctrines of 1848. Christopher Caudwell, the British Marxist of the nineteen-thirties, used a quotation from this treatise in a well-known attack on H.G. Wells's claims as a progressive writer.[7] Yet it is obvious that Marx's work as a whole is guided by 'utopian' aspirations and images. The German philosopher Ernst Bloch sees utopian thought as an expression of the irrepressible revolutionary wish of mankind. Wells, on the other hand, saw the construction of ideal societies as an essential preparation for political action. The rehabilitation of utopia is implicit in many recent varieties of socialist thinking, and provides the background for Suvin's analyses of SF history. Here he has argued, in opposition to critics who trace science fiction back to the adventure story or the Gothic romance, that its vital precursors are the line of utopian thinkers from More to Shelley, Fourier, Bellamy and William Morris.

Science fiction is defined by Suvin as a literature of *cognitive estrangement.*[8] It is cognitive by virtue of its affiliation to science and rationality, and "estranged" by its presentation of conceptual "new worlds" which should aim at producing a Brechtian *Verfremdungseffekt.* (The function of *Verfremdung* or estrangement is defined by Ernst Bloch, in a commentary on Bertolt Brecht, as "the provision of a shocking and distancing mirror above the all too familiar reality."[9]) Science fiction, by presenting an estranged world which has a determinate and logical relation to the real world (not necessarily, however, a simple relationship of extrapolation or of allegory) has the task of combating conventional or ideological views of reality, and reflecting the true picture of man's needs and deprivations. The difference between this and the "philosophical apocalypse" of a critic such as Ketterer depends upon the politically subversive character of a utopian as opposed to a *merely* religious or philosophical vision.

Suvin invokes a structuralist model of literary history, which is partly derived from Northrop Frye, to explain the link between classical utopia and modern science fiction. In the nineteenth century, he argues, the libertarian and egalitarian hopes unleashed by the French Revolution produced a spate of utopian works. Jules Verne's science fiction reflects this transcendent optimism. H.G. Wells was at the end of this tradition, but he also reintroduced the satirical utopia or "dystopia" modelled on the work of Jonathan Swift. Twentieth-century historical and ideological conditions have given to dystopia an unprecedented importance–consider the impact of *Brave New World* and *1984*–and in the West there have been very few post-Wellsian positive utopias of any value. (Such utopias as have been written tend to be as anti-humanist as B.F. Skinner's *Walden Two.*) The alien worlds portrayed in modern science fiction, whether in the form of

totalitarian states, crumbling empires of dying and hostile planets, tend to be negatively valued in relation to our own.[10] Suvin has pointed out that the utopian tradition has survived most forcefully in the USSR, as for example in Ivan Yefremov's SF novel *Andromeda* (1958).[11] Yet there is, he insists, a dialectical relationship between positive and negative utopia, and hence between classical utopia and SF. In historical terms, he suggests an intrinsic spiral development which will bring the utopian paradigm to the fore once again, when historical conditions permit. This argument—or prophecy—may perhaps be understood as embodying Suvin's own estranged, but cognitive, view of the science-fiction genre.

Suvin's thesis may be viewed as a framework or prolegomenon for science-fiction criticism. His general theory has been restated frequently in contexts varying from scholarly articles to interviews in fan magazines, and he has been able to apply it in concrete analyses of a wide variety of writers and works. A possible limitation (not as serious in SF, in fact, as it would be in other branches of literature) is that it regards the whole of the modern development since Wells as constituting a single period. This overlooks the brief impact of literary modernism on SF (represented principally by Yevgeny Zamyatin's *We*, 1921) and also the fiction of such an idiosyncratic writer as Olaf Stapledon. However, despite such reservations, Suvin's framework is the most useful account of the ideological structure of SF as yet available. Very recently there have been signs that writers may indeed be turning back towards the utopian phase of expression, as in Ursula Le Guin's *The Dispossessed* (1974). But dystopian or satirical science fiction remains the dominant form today.

Fiction in which the "other worlds" are negatively valued is not necessarily designed to make us happy, docile citizens of the world of today. Wells, Zamyatin, Orwell and others wrote with subversive intent, using a bad future to underline a bad present, and so confronting their readers with the shock of "estrangement". The fiction which results from such intentions falls roughly into two classes. There is the novel of extrapolation, usually set in the near future and dramatizing the threat posed by contemporary social developments; this is the continuation of literary realism by other, not very dissimilar, means. More truly speculative, however, is the "epistemological satire" which examines the limits of human nature and man's reason through the device of a parallel world, which is usually in the future but has no linear or directly historical relation to the present. Where the novel of extrapolation takes a particular problem such as overpopulation or pollution, and shows it getting disastrously worse, novels of the second kind permit a more far-reaching, "anthropological" examination of man himself. The novelists transcend conventional assumptions by showing us different social structures, different modes of thinking, different physiology and—particularly in recent novels—different kinds of sexuality.

In the remainder of this essay I propose to discuss examples of each kind of novel, which illustrate the radical directions that some contemporary writers are taking. The novels chosen are *Solaris* by Stanislaw Lem, *Far Rainbow* by Arkady and Boris Strugatsky and Le Guin's *The Dispossessed.* The first and second were written in the early nineteen-sixties in Eastern Europe; the third is recent and American. Despite enormous popularity in the Soviet bloc, Lem and the Strugatskys have only just begun to attract attention in England and America. (*Solaris* has been widely seen in the Russian film version, though in some respects this bore little relation to the Polish original.) They have affinities with what was earlier defined as "hard" SF, together with a literary power and an intellectual radicalism rarely associated with this kind of writing in the West. The novels chosen here are ones in which the values of scientists and the social and conceptual structures within which they operate are subjected to particular scrutiny.

Lenin once said that "If mankind ever comes to other planets all our philosophical, moral and social assumptions will have to be re-examined." The statement is not quite accurate, since in itself landing on other planets, as on the moon, can be little more than a hollow technological triumph. It is the discovery of alien intelligences or forms of life that would have a truly revolutionary impact. Most science fiction is concerned in some way with a confrontation with the alien, and that is the essence of its "estrangement" effect. But unlike the creations of fantasy, the alien phenomena of SF must in some respects conform to our laws (though they may equally succeed in forcing us to submit to theirs). Confrontation with the alien in science fiction is a controlled experiment which causes self-reflection and reveals something about ourselves.

The major writers in the genre have used such experiments to achieve a "reflexive anthropological effect", unmasking subversive and uncomfortable truths. H.G. Wells frequently exploits this, undermining imperialist complacency with the revelation of a Darwinian or Huxleyian view of man as a precariously evolved and probably doomed animal. The same technique may be traced back long before Wells, to Swift's *Gulliver's Travels.* Consider the unforgettable moment when Gulliver finds himself confronted by one of the race of the Houyhnhnms. This is social comedy, but goes beyond comedy to the inexplicable mystery of what it is to be human:

> "In the midst of this distress, I observed them all to run away on a sudden as fast as they could, at which I ventured to leave the tree, and pursue the road, wondering what it was that could put them into this fright. But looking on my left hand, I saw a horse walking softly into the field; which my persecutors having sooner discovered, was the cause of their flight. The horse started a little when he came near me, but soon recovering himself, looked full in my face with manifest tokens of wonder: he viewed my hands and feet, walking round me

> several times. I would have pursued my journey, but he placed himself directly in the way, yet looking with a very mild aspect, never offering the least violence. We stood gazing at each other for some time; at last I took the boldness to reach my hand towards his neck, with a design to stroke it, using the common style and whistle of jockeys when they are going to handle a strange horse. But this animal seeming to receive my civilities with disdain, shook his head, and bent his brows, softly raising up his right fore-foot to remove my hand. Then he neighed three or four times, but in so different a cadence, that I almost began to think he was speaking to himself in some language of his own."
>
> (*Gulliver's Travels*, Part IV)

Gulliver is so taken by the dignity of the rational horses that he renounces humanity altogether; when he returns to England he cannot bear to embrace his wife but finds some consolation down in the stables. In our terms, he is mad.

A modern science-fiction writer like Lem differs from Swift in that his characters are far more likely to conceptualize their difficulties with the alien, and to be aware that they are faced with a scientific and philosophical problem. If Gulliver's innocence would be implausible in modern fiction, so would his resilience; he is quite adamant in the end about preferring the society of horses to men. Of the four novels by Stanislaw Lem currently available in English, *The Invincible* (1963; Eng. trans. 1973) is an adventure-story where the hero, defeated by a planetary environment of hostile, non-living matter, ends with a dignified renunciation of cosmic exploration.[12] In *Solaris* (1961; Eng. trans. 1971) the encounter with the alien leads to a profounder, more intellectual tragedy. When Lem's hero, Kelvin, arrives at the research station on the planet Solaris, he finds two of his distinguished colleagues in what seems a state of extreme paranoia, while the third has committed suicide that morning.

The surface of Solaris is covered by an ocean, made of some colloidal substance, which is perpetually in motion and has the property of assuming endless, unrepeated shapes. The upheavals of the ocean are likened to some vast, dynamic process of architecture. Generations of scientists have been baffled by the ocean, which they believe to be some sort of intelligent organism. Gradually they have become obsessed with the humanist, almost religious, aim of "Contact" with the ocean. Throughout the history of Solaristic studies, no communication has ever been achieved. All that has happened is that a few scientists and explorers have disappeared in unexplained circumstances. Of late, however, the ocean seems to have begun pursuing its own aim of Contact. Each member of the small team that Kelvin joins on the research station has received a humanoid Visitor, usually but not necessarily a woman, synthesized by the ocean on the basis of its telepathic probing of the memories and secret obsessions of the individual

destined to receive her. The Visitors are simulacra of humanity, programmed by the ocean to stay with their hosts at all times, and capable of extraordinary violence under the panic induced by separation. The plasma of their bodies is self-healing, and when definitely got rid of (locked in a rocket-ship, for example, and blasted off into orbit) they are simply replaced by new versions after a few hours.

Lem has here constructed a mixture of Gothic horror-story and epistemological fable. The Visitors pose an appalling emotional dilemma; Kelvin, who is host to a reconstruction of his wife Rheya, who committed suicide ten years previously, is let off relatively lightly since he, unlike his colleagues, need not be ashamed to show his Visitor to the others. At least she is modelled on a real person, and not the embodiment of a private sexual obsession. Beyond the psychological drama, there is the problem of the Visitors' physical constitution, and the motivation of the intelligence which has made and sent them.

Lem's human characters approach the weird phenomena of Solaris through the habits of scientific culture; specifically, through the conceptual apparatus of "Solaristics". Kelvin spends much of his time in the library at the centre of the research station. It is as if the secrets of Solaris are contained in the scientific literature rather than in the raw phenomena which can be seen through the portholes. The "ocean of Solaris", we are told at one point, "was submerging under an ocean of printed paper" (p.169). Lem's descriptions of

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the science of Solaristics are an astonishing achievement, comparable in their technical aspects to Thomas Mann's evocation of musical genius in *Doctor Faustus* or Boris Pasternak's portrayal of poethood in *Doctor Zhivago.* There are first the virtuoso descriptions of the phenomena to be studied–the "mimoids", "extensors", "symmetriads" and other plastic forms thrown up by the ocean–and then Lem's accounts of the history and theory of Solaristics. Throughout these accounts there runs a sense of futility, the feeling that "we had not progressed an inch in the 78 years since researches had begun" (p.23). The fundamental obstacle to progress is the anthropomorphism of scientific theories, caricatured in the popular views of Solaris as the "cosmic yogi", the "autistic ocean" or even the "planet in orgasm". Lem does not hold out much hope that this anthropomorphism, which presumably applies to all science, can ever be surmounted.

The history of Solaristics that he gives would remind Anglo-American readers of Thomas Kuhn's book *The Structure of Scientific Revolutions* (though the priority seems to lie with Lem, since Kuhn came out in 1962). In Kelvin's lifetime Solaristics has declined from a dynamic field full of conflicting theories to a steady accumulation of specialized and "meaningless" data. The discipline has fragmented, so that it seems symbolically apt that Kelvin, Sartorius and Snow, a psychologist, a physicist and a cyberneticist respectively, spend most of their time locked in their cabins unwilling or unable to communicate with one another. Moreover, Lem shows that the only real insights into the nature of Solaris have been ignored or officially hushed up because they failed to fit into the prevailing assumptions as to what was "objective" and "scientific". The early stages of the ocean's "Operation Man", which led to the production of the Visitors, had in fact been observed by a pilot whose testimony was condemned as subjective and hallucinatory. Kelvin and Snow discuss whether they are better off marooned on the station, or requesting help from Earth which will inevitably result in their being committed to a mental hospital. Not only are explorers who have the courage of their own observations suspected of insanity, but the only theorists who have got near to the truth about Solaristics have been dismissed as eccentrics, pseudo-scientists and cranks.

Kelvin comes to realize that the "science" which excludes any data which do not fit its preordained schemes is really only a kind of mythology. It is anthropomorphic because based on a set of assumptions which are helpless to comprehend the real alienness of Solaris. Searching in the hope of enlightenment among the so-called lunatic fringe of Solarists, Kelvin discovers the pamphlets of Muntius, who maintained that Solaristics had become the "space era's equivalent of religion", and of Grastrom who

> "set out to demonstrate that the most abstract achievements of science, the most advanced theories and victories of mathematics

> represented nothing more than a stumbling, one or two-step progression from our rude, prehistoric, anthropomorphic understanding of the universe around us. He pointed out correspondences with the human body—the projections of our senses, the structure of our physical organization, and the physiological limitations of man—in the equations of the theory of relativity, the theorem of magnetic fields and the various unified field theories. Grastrom's conclusion was that there neither was, nor could be, any question of 'contact' between mankind and any nonhuman civilization." (p.170)

In rehabilitating such views, Kelvin is rewriting the history of Solaristics in the Kuhnian sense, in accordance with the new paradigm emerging from the experience of the Visitors. What were previously classed as apocrypha, as pseudo-scientific outbursts from the lunatic fringe, are now coming to form the main text.

In addition to his analysis of science as a kind of mythology, Lem shows us his characters' moral responses to their dilemmas as individuals and as researchers. We move from phases of acute conflict to phases of uneasy peace between Kelvin, Sartorius and Snow. Here the reader's problem is how far he ought to endorse the reactions of Kelvin, the narrator of the story. Kelvin is a humanist, standing for a romantic individualism which finds expression in his relationship with his Visitor, Rheya. Though inhuman, she is endowed with a free intelligence; Kelvin soon finds himself attached to her, and on the brink of a fantastic variant of the doomed and tainted love-relationships of romantic literature. Partly he is drawn to her by contrast with the frigid, scientific impersonality of Sartorius ("He didn't talk, he lectured, as though he were in the chair at the Institute," p.104) and the helpless apathy of Snow; but his emotional life is also made to seem more normal and less furtive than theirs. When Sartorius has established that the Visitors have a neutrino structure which can easily be destabilized, he plans either to construct a machine to destroy them, or to communicate to the ocean by means of an X-Ray transmission that they are unwelcome. In the end both plans are successful. The success of the X-Ray transmission implies that the ocean was not motivated by malice, simply by a failure to grasp the emotional torture it was inflicting on its human victims; Snow hypothesizes that "'Perhaps it was sending us .... presents'" (p.192).* Kelvin pretends to agree to his colleagues' plans, but is secretly plotting to save Rheya and "elope" with her somewhere, although she will almost certaonly be annihilated once outside the ocean's gravitational field.

Beyond his infatuation for Rheyna, Kelvin is a "believer in the mission of mankind," a scientist of the type ironically dubbed by Snow as "Knights of the Holy Contact"; it seems he will make any sacrifice, including perhaps that of his fellow-men, to keep the hope of Contact alive. Kelvin is contrasted with Sartorius, the physicist who defies a UN convention against the use

*Compare the message of "Greetings" sent from one end of the universe to the other (with incidental assistance from the whole of human history) in Vonnegut's *The Sirens of Titan* (1963).

of heavy radiation when he bombards the ocean. Snow stands between these extremes as a sceptic and a realist for whom humanity is always preferable to the alien. Though the ending of the novel is brilliantly cryptic, it may be read as a decisive endorsement of Snow, the tough-minded sceptic, against the liberal idealist Kelvin.

Kelvin's erotic dilemma is resolved by Rheya, who comes to understand that the only "free" choice before her is suicide. Once she has gone, he continues to wrestle with the Solaris phenomenon, but his attempts to explain it become increasingly mystical. The physical mechanism of the ocean's "Operation Man" seems fairly clear, being based on the ability to perceive and reproduce the structure of certain complex molecules stored in the memory-bank of the brain. The "hard science" behind *Solaris* is the discovery of DNA, with its hint of the possible physical reproduction of humanity by artificial means and for non-human ends. But though Kelvin is a psychologist, he has no more than a vague psychological hypothesis as to the factors determining the identity of the Visitors. Instead, he finally toys with the religious idea of Solaris as the manifestation of an "imperfect God". Snow, it is true, adds to this hypothesis by suggesting that the ocean could be an infantile deity: "'Everything is explicable in terms of the behaviour of a small child'" (p.199). But he does so ironically, and later disowns the idea, which is evidently just a further piece of anthropomorphism.

How is the vicious circle of man's scientific and philosophical efforts to

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be broken? Gibarian, before committing suicide, seems to have come to a Wittgensteinian impasse: "'Where there are no men, there cannot be motives accessible to men'" (p.134).[13] Snow suggests that the whole craze for space-exploration represents a massive evasion of man's real problems: "Man has gone out to explore other worlds and other civilizations without having explored his own labyrinth of dark passages and secret chambers, and without finding what lies behind doorways that he himself has sealed." (p.157). But the novel ends with Kelvin going outside the research station for the first time and visiting the surface of the ocean. It sounds no more than a long overdue empirical gesture: "'When I get back to Earth I don't want to have to confess that I'm a Solarist who has never set foot on Solaris!'" he explains (p.200). But in fact he is rationalizing what is essentially a religious act, prompted by a kind of nature-mysticism. Snow cautions him not to go; disregarding this, Kelvin seems to break with the last of his ties with human society, and once on the planet's surface he decides not to accompany the others on their return to Earth. Standing on the shore of an "old mimoid", he plays a peculiar game with the ocean, stretching out his hand to an incoming wave:

> "What followed was a faithful reproduction of a phenomenon which had been analyzed a century before: the wave hesitated, recoiled, then enveloped my hand without touching it, so that a thin covering of 'air' separated my glove inside a cavity which had been fluid a moment previously, and now had a fleshy consistency. I raised my hand slowly, and the wave, or rather an outcrop of the wave, rose at the same time, enfolding my hand in a translucent cyst with greenish reflections. I stood up, so as to raise my hand still higher, and the gelatinous substance stretched like a rope, but did not break .... I repeated the game several times, until—as the first experimenter had observed—a wave arrived which avoided me indifferently, as if bored with a too familiar sensation. I knew that to revive the 'curiosity' of the ocean I would have to wait several hours." (p.203).

One form of "curiosity" encounters another; this is the nearest thing to Contact that Kelvin is ever likely to experience.[14] He is moved by it to stay on Solaris, "in the faith that the time of cruel miracles was not past." He has abandoned human trust and solidarity in favour of a commitment which is not one of scientific reason but of personal religious faith. I think that this ending recalls Gulliver's fate at the end of his travels (the research station suspended over the ocean, incidentally, is very reminiscent of Swift's Flying Island) and perhaps also Cavor's fate at the end of Wells's *First Men in the Moon*. It is the fate of a man who has deserted humanity for the alien, and so is tragic but also absurd, a symbolic gesture holding at bay the recognition of despair. Kelvin has followed through the logic of the scientist-explorer in the liberal humanist tradition, until he is finally the victim of an isolating, romantic obsession.

Solaris, then, exposes the epistemological and the moral limitations of the scientific consciousness. Lem's exposure of the "space era's equivalent to religion", far too subtle to be taken for allegory, provides an estranged and "anthropological" view of contemporary scientific culture and its investment on the space age. The fate of his hero shows how, for all its atmosphere of community and teamwork, the ethic of "pure research" promotes an isolated, individualist consciousness. Kelvin may well be the last of the line of "great" Solarists; a scientist who, absorbed in the problem of the ocean and in communing with the Solarists of the past, has little time for his fellow-researchers, let alone the society left behind on Earth.

The novel which shows him in this light has a profundity and tightness of construction which can hardly be faulted. Its scope, however, seems to me to be narrowed in two important respects. Because of his concentration on the problem of Solaris, Lem's critique does not extend to the social, economic and ideological foundations on which science is built. Once Earth is left behind the PhDs, research institutes and space stations of a novel like this seem to be the natural outgrowths of the society from which Kelvin comes. Rheya's self-sacrifice on his behalf is one of many details which tend to confirm Kelvin's privileged status as the representative of man's quest for knowledge (privileged both as scientist and as male), at least for the unwary reader. It was notable that the Russian film version tried, rather unsuccessfully, to give the picture of Kelvin's life on Earth which the novel deliberately avoids. Failing this, an alternative might have been to bring out the character of Snow, who appears as a sceptical chorus rather than the embodiment of a positive alternative to Kelvin's attitudes. As it is, *Solaris* makes no open break with the "man's world" of traditional SF, so that a reader who disregarded Lem's clues and subtle directions could find himself taking it as a conventional (if unusually cerebral) saga of the scientist-as-hero. The novel may be valuably contrasted with the blunter and more explicit social critiques of Arkady and Boris Strugatsky.

Both Lem and the Strugatskys are socialist writers, but the latter, with their overtly political tales of recognizable societies and representative social types, are a good deal closer to the official Communist doctrine of socialist realism. (Ironically it is they rather than Lem who have had to contend with official disapproval.[15]) Their work is uneven and its availability uncertain: *Far Rainbow*, published in an English translation by MIR Publishers (Moscow) in 1967, now seems virtually unobtainable here. The recent appearance of their stories *Hard To Be a God* and "The Second Martian Invasion" in the West may portend better things to come.[16]

While these two stories are social fables first and foremost, *Far Rainbow* is, like *Solaris*, a study of scientific culture set on a planet inhabited only by a colony of research workers. The Strugatskys' concern is not with scientific epistemology but with the nature of the research community and its relation

to society back on Earth. Rainbow, the "physicists' planet", is the scene of top-priority experiments in "null-transmission" or "null-T", a mode of instantaneous transmission of material objects in space. The huge discharge of radiation involved in these experiments is causing alarming atmospheric effects at the planet's two poles. The scientists, however, live in the equatorial zone. Little notice is taken even when the lethal black wave of energy fallout begins to move southward from the North Pole across the remote seas and steppes. Analogies are not hard to draw here (Siberia? H-tests? Marine and agricultural pollution?) but the story is essentially a controlled experiment to test the scientific ethos. Driven on by the thirst for results, the researchers become more and more divorced from reality. They are used to being supplied with all they ask for, but their orders for energy-producing equipment ("ulmotrons", or portable atomic reactors, which have to be hand-assembled on Earth) become impossible to fulfil. Finally they are trapped and destroyed by the black wave, which advances across the whole planet.

How does the research ethic stand up in the face of impending disaster? The Strugatskys' portrayal of the unprincipled panic that ensues is disturbingly real. The pampered null-physicists are completely unable to handle this situation of their own making. Lamondois, the planet's leading scientist, looks and talks (as other theromnuclear experts have done) like a school-leaver. Since there is general scarcity his subordinates are forced to spend much of their time queuing for ulmotrons or pinching one another's allocations of energy. The novel conveys a strong sense of the gulf between the scientific leaders and the "proletariat" of technicians and junior 'researchers' (sic), for whom science has become either a childishly competitive pursuit or a meaningless bureaucracy. The organization of science on Rainbow is in fact, as one of the technicians suggests, a basically capitalist organization:

> "Lorentz talks about natural selection operating in science. Which factors determine the direction of science these days when science has very little bearing on man's material well-being? . . . . After a while

IAN FLEMING'S
James Bond
DRAWING BY HORAK
A BRILLIANT ACHIEVEMENT, DR. MULROY— TURNING THE LIFE-GIVING LIGHT OF THE SUN INTO A SOLAR DEATH RAY!
I'M A SCIENTIST —NOT A MORALIST, MR. BOND!
MEANING YOU TAKE YOUR MONEY, AND THE HELL WITH MANKIND, EH?

those scientific researches that are the most successful will gather all the supplies to themselves and the rest will just fizzle out. And all research will consist of two or three directions and only the top men will have any idea of what they're doing." (pp.69-70).

On Rainbow "null-T" is driving towards a monopoly, although null-T is more or less useless to man since it reduces living beings to "heaps of organic slag."

The top men have no idea what they are doing, but the story's main character is Sklyarov, a young, spoilt child of the scientific élite (as a boy he once posed for a statue of the "Youth of the World") whose behaviour in the evacuation caused by the wave exemplifies the general collapse of moral values. In the panic he abandons a colleague and a planeload of children in the jungle to make a desperate, abortive bid to save his girlfriend. Other researchers are equally obsessed with the need to save their personal files

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and equipment, which they feel to be more important than human lives. The scientists' self-importance is offset against the conduct of the spaceship captain, a visitor to Rainbow who sacrifices his place on the last shuttle to leave the planet. Waiting for the end, he is astonished to perceive that some of the Rainbow community still hope to be saved: "the most sceptical and logical men on the planet were now relying on a miracle" (p.144). Whether or not this is a "fair" picture, the book is an acrid fable of the fall of a corrupted, parasitic class. The black wave which is the immediate cause of the catastrophe might be understood as the symbol of a revolution, manifesting itself as the Nemesis of modern physics.

Central to *Far Rainbow* is the idea of a "moment of crisis" in which a class ideology is shown up in its nakedness and the ultimate moral resources of individuals are put to the test. Such crisis-moments confront the individual with a dilemma which is rarely simple and ambiguous. They play a major part in literature and are also a crucial feature of the experience of social revolution. One function of science fiction may be to present the imagination with vivid analogies for this revolutionary experience, through the device of a parallel world such as Rainbow. While there are difficulties in portraying the *making* of a revolution convincingly, science fiction excels at evoking its effects–although in the present 'dystopian' age these effects have usually been evoked through negative analogies of panic and natural catastrophe.

The Strugatsky brothers' profound, though perhaps disenchanted, concern with revolution might be studied further in *Hard To Be a God* and "The Second Martian Invasion"–two political fables of societies undergoing a violent and sinister transfer of power. The second of these stories especially has a breadth of implication which leaves "scientific" concerns behind completely. The invaders administer the Earth by means of humanoid robots who go round the countryside suppressing dissidents and collecting gastric juices from the inhabitants. Events are seen entirely as they impinge on an isolated country village–a viewpoint strongly recalling Ignazio Silone's classic anti-Fascist novel *Fontamara* (1934). More and more of the villagers are persuaded of the benefits of a society in which laboratories, research institutes and other instruments of "progress" will no longer be needed–after all, as one of the characters says, "as a factory of gastric juice" Albert Einstein is no better than the village policeman.[17]

What are the chances of a science fiction with radical interests in which science is shown in a positive light? There are obvious reasons for the hostility towards contemporary science in the novels I have discussed. But for most people the vision of a world made better through scientific and technological progress remains part of the necessary heritage of socialist and utopian thought. In popular Anglo-American SF we are familiar with the idea of the intergalactic union of worlds made possible by new forms of space-drive. While the union of worlds is a progressive and internationalist

concept, most science-fictional representations of it have followed a blatantly imperialist model. The universe is portrayed as a vast "free world" supplied and indoctrinated by Earthmen and patrolled by the cosmic CIA. Recently, however, the Hainish cycle of novels by Ursula Le Guin has strikingly restored the revolutionary perspectives inherent in this apparently unpromising theme.

Le Guin's League of All Worlds is made possible by the invention of the "ansible", an instantaneous communication device. There is no space here to go into the details of her novel-cycle, which began with *Rocannon's World* (1966).[18] But in her latest novel *The Dispossessed* (1974), the theory of the ansible is shown to be the discovery of Shevek, a physicist brought up in the anarchist society of Anarres. Anarres, a breakaway colony founded by political refugees from the planet of Urras, has tried in conditions of acute scarcity to implement the principles of freedom, equality and permanent revolution. Shevek, as a physicist of genius, is a man of high principle who finds the compromises that his fellow-citizens have learned to accept intolerable. His scientific work is continually frustrated by his society's self-imposed isolation. Eventually he takes the decisive and dangerous step of emigrating to Urras. While Anarres was indifferent to his theoretical gifts, the government of Urras is only too keen to develop the ansible for its own political ends. Shevek manages to salvage his theory for the cosmos in general when he flees to the Terran embassy and confides in the Earthmen and Hainish.

In this novel Le Guin achieves the daunting task of a psychological study of a man who is at once a great scientist and an exemplary product (and victim) of an anarchist community. Her creation of Anarres is splendidly successful. Where some qualms may perhaps be felt is in the experiences of Shevek on Urras, and especially in the transparent servility of the Urrasti scientists who are all shown as government spies. The concept of disinterested research has no meaning on either world, it would seem, except for Shevek and some of his schoolmates. Not one of his Urrasti colleagues seems even to be torn by divided allegiances. Of course, the Urrasti are not "human", but the lack of any clear distinction between political aims and personal motivation makes this part of the novel too blatantly propagandist. It may be noted that the science described in the book is the most rarefied kind of theoretical physics: all Shevek needs to help him produce the theory of the ansible are the bare necessities of life, a private room, access to a library and a desk computer. The novel concentrates more on the psychology of Shevek himself than on the institutional aspects of science revealed in *Solaris* and *Far Rainbow. The Dispossessed*, like these novels, stops short of the possibility of conceiving an alternative science freed from the distortions and perversions of contemporary society. The scientific establishments in the book are no better than those on Earth, while the anarchist society of

Anarres is deliberately and delicately ambiguous. One reason why I find these novels exciting and valuable is that they generate problems that they do not solve and expectations they are unable to fulfil. The next wave of SF writers has everything to learn from the penetrating if black art of Lem and the Strugatskys, and from the wary optimism of Le Guin.

Science fiction is capable either of reinforcing the *status quo* or of helping to undermine it. That is, like all literature and imagining, it is ambivalent. The challenge for radical readers, writers and critics is to enhance the liberatory valencies at the expense of the reactionary ones. As science-fiction writers develop their craft, every aspect of human theory and practice may come within the scope of their work. Central to the genre, however, is the questioning of the scientific activity itself, distinguishing between its fundamentally progressive role for mankind and the distortions it undergoes in the current economic and political system.

NOTES

This essay owes much to the stimulus and criticism of Bob Young and Gavin Browning of the RSJ collective. My thanks to them both.

1. On the theory of youth sub-cultures from a radical viewpoint, see the recent double issue of *Working Papers in Cultural Studies* (Nos. 7/8, Summer 1975).
2. See Beverly Friend, "Virgin Territory" in *Extrapolation* 14 (December 1972), 49ff. Lundwall's essay comes in his book *Science Fiction: What It's All About.*
3. This is not to slight the importance of the earlier history of SF, including dozens of forgotten writers as well as Wells, Verne and their peers. A bare acknowledgement of this must suffice in the present context.
4. See William Atheling, Jr. (James Blish), "Cathedrals in Space" in *The Issue at Hand*, Chicago (Advent) 1964.
5. The essay by Fredric Jameson referred to is "Generic Discontinuities in SF: Brian Aldiss' *Starship*", in *Science-Fiction Studies* 1 (Fall 1973), 57ff.
6. Joanna Russ, "Towards an Aesthetic of Science Fiction" in *Science-Fiction Studies* 2 (1975), 112ff.
7. Caudwell, *Studies in a Dying Culture*, London 1938, p.74.
8. See Suvin, "On the Poetics of the Science Fiction Genre" in *College English* 34 (1972), 372ff.
9. Quoted by Suvin, "*The Time Machine* versus *Utopia* as a Structural Model for Science Fiction", *Comparative Literature Studies* 10 (1973), 251ff.
10. Suvin, ibid.
11. See the preface to Suvin's anthology *Other Worlds, Other Seas*, New York (Random House) 1970.

12. Besides *Solaris* and *The Invincible*, two further Lem titles, *The Cyberiad* and *The Futurological Congress*, were published by Secker & Warburg at the end of 1975.

    Quotations from and references to *Solaris* are to the translation by Joanna Kilmartin and Steve Cox published by Arrow Books (London 1973). This is a translation from the German translation of the Polish original. For convenience I have cited proper names in the forms given in this edition: the original forms were, however, used in the English subtitles to the film.

"We're not here. We've gone out.
Try ringing back after 'Star Trek'.
This is a recording."

13. In the translation at least, this echoes Ludwig Wittgenstein's dictum "Whereof we cannot speak, thereof must we remain silent" in *Tractatus Logico-Philosophicus* (1921).
14. Ketterer in *New Worlds for Old*, New York (Anchor Books) 1974, pp. 197ff., has a very different interpretation of this scene.
15. See Darko Suvin, "Criticism of the Strugatskii Brothers' Work", in *Canadian-American Slavic Studies* 6 (1972), 286ff.
16. Arkadi and Boris Strugatski, *Hard To Be a God*, London 1975, and "The Second Martian Invasion" in *Vortex*, ed. C.G. Bearne, London (Pan Books) 1971.

    Quotations from and references to *Far Rainbow* are to the translation by A.G. Myers published by MIR Publishers (Moscow) 1967.
17. "The Second Martian Invasion" in *Vortex*, p.180.
18. The other novels in the cycle are *Planet of Exile* (1966), *City of Illusions* (1967), *The Left Hand of Darkness* (1969), *The Lathe of Heaven* (1971) and "The Word for World is Forest" (1972). For a discussion of the structure of the cycle see Ian Watson, "Le Guin's Lathe of Heaven and the Role of Dick", in *Science-Fiction Studies* 2 (1975), 67ff.

Comment

NOTES FROM A SCI-FI FREAK

Gavin Browning

There is a tension between liking science-fiction and holding revolutionary political views. Some people can see the obvious ideologies expressed in various SF tales, often reactionary and scientistic, but continue to read, and probably disapprove of, each new story that takes their eye. Pat Parrinder's article argues that 'SF can be understood potentially . . . as a literature embodying the values of a radical alternative society'. The tension is set up when the SF setting, entrancing in itself, conflicts with the present day political theory and practice of the reader; this may vary from thinking 'people aren't/will not be like that' to the more definite 'this writer believes in militarism, and is preaching it here'. No imagined future will totally conform to the readers' political persuasions, and most often the tension and dislike (in spite of which we continue to read) is set up. This continuing is a result of feeling/understanding something of value in the text; although the conflict exists, so does that radical potential in the wider worlds of imagination.

The ambivalence or tension is, I suspect, inevitable. The author is in a dilemma. Leaving aside that part of the literature whose values are thoroughly reactionary or escapist, how is the radical potential of SF realised?—the embodiment of 'the values of a radical alternative society' is a tall order for any author; SF gives the writer more space to do this in. The dilemma involves the expression of radical values in portraying the future; on the one hand society can be portrayed developing as the radical author wants it to, and can be set in a future resulting from this. These Utopias of one sort or another portray a revolutionised society whose interests, in the main, are not ours. On the other hand the future is seen in the forms of today, economic, social, and political (with the added possibilities of a possible future), these forms being critically transmuted to give a radical view of our society; this can degenerate, for example into technological optimism supporting the present status quo as valid for all time, but can also build up in varying aspects that embodiment of the values of a radical alternative society that SF can give. In the first case a post-revolutionary society is created (a Utopia), but it is difficult to portray and relate to present society, while in the second this central element is not present, creating the tension, but the critique of present society and the radical portrayal of people in a new setting (a non-sexist society for example) reflects very strongly on the present. A story may be situated anywhere between these two poles, but the basic dilemma, the radical tension, will appear.

This argument sees the radical potential and the reasons for the political tension, but the fact also remains that non-radical, reactionary, sexist and ruling ideology-ridden SF is also read in large amounts, maybe with the tension, but with very little articulation of the larger conflicts of values between the reader and the story. In some stories the ideology is clearly reactionary, and can almost be ignored as one is reading the story, which retains its own special SF attraction. It is still read, and this should be enlarged upon (it's a good story, O.K.?). The problem with the good story (one that keeps you reading) with reactionary values or elements is that unless the reader is on guard these elements sink into the consciousness as another reinforcer of ruling ideology. So, radicals beware! and be critical when reading SF. This critical stance may well increase the value and enjoyability of the tale.

Thus the framework for a limited critical reading list for Pat Parrinder's article; some books that may illustrate the above argument. Please note that they are *all* books I have enjoyed reading.

Alfred Bester, *Tiger, Tiger* (Penguin)

It is a measure of the quality of this book that, except in small details, it does not seem dated over 20 years after publication. Set in the 23rd century, it is the story of a 'stereotyped common man' whose potential is released by shock and hardship. He is compelled by inner drive to fight against the powers of the ruling system (dynastic megacorporations in a fossilised capitalist world with caste and class divisions, and running on expansion through the solar system). A critical and brilliantly imaginative extension of the present.

Ursula Le Guin, *The Dispossessed* (Pan)

The great achievement here is the portrayal of an anarchist Utopian society in a future. The world society has a twin world similar to our earth and the contrasts between the two are devastating. The story is of the physicist Shevek living out his anarchist principles and his development of a new kind of physics. The process of scientific discovery is considered in some detail, and Shevek's eventual achievement is seen as a result of his world's ideas, where the most reviled forms of behaviour are those summed up in the derogatory terms 'propertarian' and 'profiteer', together with the accusation 'you're egoising!' A great book. See review in *Undercurrents* No.11.

Larry Niven and Jerry Pournelle, *The Mote in God's Eye*

They are all here, and beautifully fitted together, the classic themes of many SF stories: a military organisation, an interstellar human empire, the stereotyped Scots engineer, the conflict and contact with aliens, the fascination with technology, space battles, and young handsome aristocratic hero. However, the authors have achieved the quintessence of this type of writing. A future history is given, showing how this sexist, militaristic (I suspect some borrowing from C.S. Forester) organisation grew up, and how the authoritarian Empire is the only hope for mankind. Basically reactionary in many

of its concerns, it is very clearly laid out, and the alien contact theme is brilliantly dealt with (although the aliens have very differentiated subspecies, and are engaged in a super-Darwinian 'red in tooth' etc. struggle for existence). This book sums up the attraction of traditional 'hard' SF.

Frank Herbert, *Dune* (NEL)

A long, now classic, work, based on Arabic/Sufic traditions and an ecological understanding. Another galactic empire, and hero with super-human powers. Has been followed by sequels of declining quality.

Michael Moorcock, *The English Assassin* (Quartet)

He writes in two styles, both of which can be seen in any bookshop in England: fantasy of the sword and sorcery type, and somewhat more serious novels such as this. Chaos is a theme and political process is ignored. This contains much acute observation of the present.

Roger Zelazny, *Lord of Light* (Panther)

An entertaining writer who changes and uses old mythologies fitting them to characters who generally embody a liberal outlook. This book deals with the Hindu/Buddhist tradition, and is perhaps his best. All his central characters smoke tobacco and drink alcohol; they are individualist and tend to be immortal; they are not very human. A somewhat sexist writer of very readable tales.

John Brunner, *The Sheep Look Up*

A book of ecodisasters; can the eco-activists save the world as the USA sinks into pollution? Totally ignores both the origins of pollution (it just happens) and the possibility of organised political action. He is a prolific liberal author—his *Stand on Zanzibar* is similar on the population theme.

Samuel R. Delany, *Dhalgren* (Bantam)

This may be the most influential SF book ever—certainly the most complex so far. The time and place are uncertain but simplified, few science gadgets are used, and it contains, among so much else, a devastating exposition of the unreality of the bourgeois way of life. He has an understanding of the way politics work, but avoids discussing this overtly due to the setting he chooses. This may be the most radical of the books discussed here. His other work is well worth reading too.

And now a cross-section of some other books spanning the SF field:

Philip Jose Farmer, *A Private Cosmos*
Riders of the Purple Wage
Tom Disch, *334*
Camp Concentration
Hal Clement, *Mission of Gravity*
A.E. Van Vogt, *Voyage of the Space Beagle*
J. Wyndham, *The Day of the Triffids*
R. Heinlein, *Starship Troopers*

Bob Young

Science is social relations

When I think back on all the crap I learned in high school
It's a wonder I can think at all,
And my lack of education hasn't hurt me none:
I can read the writing on the wall.

Kodachrome–it gives the nice bright colours,
Gives us the green of summers,
Makes you think all the world's a sunny day
Oh yeah
I got a Nikon camera.
I love to take photographs,
So mama don't take my Kodachrome away.

If you took all the girls I knew when I was single
And brought them all together for one night,
I know they'd never match my sweet imagination:
Everything looks worse in black and white.

Kodachrome . . . (*chorus*)
Mama don't take my Kodachrome
And leave your boy so far from home
Mama don't take my Kodachrome away.

–*There Goes Rhymin Simon*
CBS 569035 (1973)

Gearing Up

It is time to move on both in theory and in practice. It is time that our critiques of authoritarian and hierarchical societies–both capitalist and nominally socialist–and of their science, went on the offensive. It is time that our theories and our lives expressed struggle towards socialism and prefigured that social order in the process. We have had (or at least proclaimed) our counter-culture and our alternative technology. We now need to embark on the construction of a counter-reality and an alternative cosmology. Only socialist theory based on attempts to move toward

socialist lives as a way to a socialist society, can produce socialist science.

A clearer, starker awareness of the full integration of science and technology—at *all* levels—into capitalism, can help us to achieve real solidarity between scientific and technological workers and the working class as traditionally conceived and to develop strategies for struggle for the mediators of authority, expertise and power in industrial societies. Scientific and technological staffs in teaching, research and industry are becoming proletarianized, but they remain incompletely so. Unless we are to wait and cheer and indulge in struggles which are unrelated to our mediating roles, we must look closely at the theoretical and practical struggles which are integral to scientific settings but arise from new left, student movement, feminist and life-style perspectives. But in order to do this in a way which has promise for contributing to revolutionary struggle—in order, that is, to avoid mere self-indulgent idealism—we must learn to see those settings in a new light which owes almost everything to the critique of traditional industrial struggles and settings.

There are three themes in this exploratory argument for seeing science *as* social relations. The first is the strategic exhortation that we move on, both in theory and in practice. The second is the conception of an alternative cosmology or counter-hegemonic world view, which I offer as a large step beyond recent preoccupations with questions which still lie inside an ontology and an epistemology which contain and express our alienated world view in modern science and society. We need to become much more aware of the metaphysical assumptions underlying modern science and to transcend that metaphysics and put meaning and value back into our conceptions of nature, science and society: to revive life and to reinvest nature and comradeship with our values. The third theme concerns the lives of radical scientists and technologists and argues that those lives should involve prefigurative struggle toward socialism by getting priorities right and letting other activities find their own level. For some of us this means self-protection from backsliding by means of burning some boats and/or biting some hands that have fed us or might do. For all it means combining trades union work with other prefigurative strategies in our lives and our institutional settings. For the most part these strategies have yet to be developed, and this essay is an exploration towards a working programme for radical scientists and technologists. It began life as a talk delivered to a British Society for Social Responsibility in Science conference on 'Is There a Socialist Science?', February 1975. Since then it has been much expanded and changed in the light of discussions and criticisms. Its shortcomings reflect my own background, which has been overwhelmingly more academic than industrial. I hope that comrades who are in solidarity with the basic orientation of the argument will redress the balance.

I know that the style of this essay is sometimes weird. I am trying to develop a way of writing which treads a new path between the didactic

and the evocative and which aims, above all, to persuade. I know that in this essay I haven't got very far and am often most assertive when I am trying out a new idea and most heavy and evangelical when I would prefer to be gentler and more seductive. And there are repetitions as I try to win over comrades by different ways of illuminating a point in an attempt to be moving. I am trying to move on from earlier exploratory pieces in ways which reflect my own changing politics and life situation (I'm thinking, in particular, of 'Evolutionary Biology and Ideology: Then and Now', 'The Historiographic and Ideological Contexts of the Nineteenth-Century Debate on Man's Place in Nature', and 'The Human Limits of Nature'). At least I've managed to get away from long discursive footnotes. The bibliography at the end of the article only includes items quoted or alluded to in the text. An annotated resources list which includes a wider range of intellectual means of production on issues raised by this and other articles in the *Radical Science Journal* has been prepared by the RSJ Collective and is available by post.

Lots of people have helped me to revise and rethink the position and presentation. I have managed to benefit from almost all comradely critics, though I still haven't got right the interface between by argument and trades union and working class struggles. I hope, though, that I've made it possible for others to move forward on that front by raising the issue for scientific workers. Anyway, thanks especially to David Albury, Vic Seidler, David Dickson, John Goodman, Karl Figlio, Jonathan Cooke, Michael Young, Brian Hurwitz, Maureen McNeil, Luke Hodgkin, Charlie Clutterbuck, Les Levidow, Anne Cooke, Mike and Pauleen Hales, Bob Eccleshall, Simon Pickvance, Dot Griffiths, Michael Green, Brian Easlea, Jeremy Mulford, Loup Verlet, Gianna Pomata, Harvey Brown, Edward Yoxen, Gary Werskey, Margot Waddell, Joseph Schwartz.

If you ever feel lost in what I'm saying, it may help to note that my approach is to describe science as much as possible in terms drawn from marxist political economy and from the critique of industry and the division of labour. The economy and the factory are known by socialists to be social relations, that is, they are manifestations of the relations between social classes. I want to begin to familiarize us with talking about science in that way. An additional advantage of this approach is that it may help the radical science movement to bring into closer relations several tendencies which have recently begun to drift apart: theoretical and agitational, university and industrial, research and applied, trades union activities and life-style politics. I'm trying to improve communication and comradeship among these tendencies. For too long it has seemed that radicals who were also scientists were faced with two alternatives: separate their science from their political work in solidarity with the working class

(seeing the science as relatively progressive) or abandon their science for full-time politics involving some mixture of industrial agitation and political work and expression in other areas of their lives. I am suggesting that there is much to do in our own labs and other institutions, in our own research and teaching and in our own lives and that when we have got into this radical ization our relations with the industrial working class in our own lives and labs and other sectors will be less patronising, voluntaristic and artificial. Once again, the project is to elaborate a strategy of revolutionary practice for people whose mediating role is based on expertise in a way which brings some of the advantages of that position to bear on struggle.

In the period between writing the first and the second drafts of this essay I have been attending a series of open meetings in London on aspects of 'Science and Socialism'. They were well-attended, though it was very difficult for people working in industry or for women with children to come at the set time. (A later time was agreed for a session by the Women and Science collective on the politics of contraception.) The meetings were deliberately held in a room over a pub in preference to an academic setting. The talks and the orientation were biased in favour of industrial issues, thereby rightly counteracting the theoretical and academic bias of many similar series. Yet it remained true that the overwhelming majority of the participants were earning their livings and spending their working lives in tertiary education and / or academic research. There is something faintly ludicrous about a group of people who teach and do research talking largely about industrial 'point of production' politics and not about struggles in their own places of work and in their own lives. There are—as I argue below—important lessons for such people to learn from and about industrial struggles in non-academic settings. But it is also important not to pretend that there are no special issues for such people. It is often stressed that more scientists work in industry than anywhere else. But many also work in education and academic research. I haven't seen the figures for chemistry, though I'd expect them to be biased toward industry. But there are 14,800 research biologists in the United Kingdom; 10,800 work in universities; 1,000 for the Agricultural Research Council; 900 for the Medical Research Council; 600 for the government; 1,500 in industry—10%.

Yet the discussions were not concerned with problems of union organising and struggle in academic and research settings; the relations between research and teaching on the one hand and industrial struggles on the other; the needs and problems of research assistants; the exploitation of junior staff and students; the structure of teaching and laboratory situations; the production, reproduction, socialisation and maintenance of labour power; productive *vs* unproductive labour; direct *vs* indirect exploitation. I list these themes because they seem to me to be among those which need to be explored under the general strategy of where and how radical scientists can organise and struggle effectively.

Socialist Science

But in putting the issues this way I am already assuming that the argument is finished and that the title of the conference was rhetorical. I'm sure, however, that to most scientists, the answer to the question 'Is there a socialist science?' is either 'No,' or at best, 'Maybe one day'. So let me briefly (because, as I said, it's time to move on) review the argument. We *have* moved on to the extent that most radicals would no longer wish to argue that science is neutral, value-free or exempt from ideology. There are still many who have not systematically applied that conclusion to all science, to their science, to their research or to their lives, but the conclusion is there—at least in theory. (I'll deal later with those who may not care much about science but certainly want to claim 'scientificity' for their brand of marxism.) We have also moved on in the sense that many radical scientists are trying to develop practices which are in solidarity with working class struggles, e.g., work on industrial health and safety and community science and technology. But many are still hung up on the special claims and status of science and experts.

If science is not value-neutral, then what values does it reflect, reinforce and reproduce? For a marxist there can be only one answer to that question: the ruling ideas of any epoch are the ideas of its ruling class. (In case you are wondering what I'd say about societies whose ruling class is not capitalist, I'd reply that I am talking about all hierarchical and

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authoritarian societies, both capitalist and nominally socialist. I know of societies which have begun to deviate from that norm but none which has got very far.) If we say that science is not value-neutral, then we must mean that science thereby gets included in the critique of values. In its radical form the critique of values is the critique of ideologies. Then science—not some science or some sciences some of the time, but *science*—is ideological. We live under capitalism, so we have capitalist science. We want to bring a different set of values into being, to bring about a new set of ruling ideas—ideas of a society without rulers, a part of a different ideology or world-view. We want to bring about a socialist society. It will, if we are vigilant, have a socialist science. I can imagine it, or some of it.

So: Is there a socialist science? No; no more than there is a socialist society. But is socialism possible? Yes, we are struggling to bring it into being. I can imagine it, or some of it. To repeat: science is not value-neutral; it embodies capitalist and other hierarchical values. Our values are aimed at bringing about a different world-view—an alternative cosmology—that of socialism. Our scientific practice is therefore aimed at becoming part of socialist science. If so, we'd better get on with it in that scientific practice. (By the way, if you don't think that science is part of the world-view in which it is practiced, then you think it's value-neutral and cannot believe in a specifically socialist science, only in science under socialism. You don't really have to disturb yourself at work until the industrial working class has produced the revolution. That's a relief, isn't it?) The problem is to move from science which *is* capitalist to science which *is* socialist. In practice, in our work and lives, the problem is to place our work in science —our social relations at work and in other settings—inside (not alongside) our socialism. That is the second sense in which it is time to move on: to change our work and the rest of our lives so that our socialism comes first. Not many self-styled radical scientists have got round to that.

No Relations Between Things

My title is meant to be provocative but not facetious. If we say that science is not value-neutral, that it is value-laden or ideological, then we say it expresses in complex ways—or mediates—how people treat each other. Ideology is not, on this argument, mere distortion or false-consciousness. World-views are ideological, and an ideology is a world-view. Science *is* ideological, though it is about the real world we live in as well. But that needn't be puzzling: capitalism is ideological, and I find that very real as well, don't you? Ideologies are based ultimately on conceptions of social relations. Comrades who find my conception of ideology (in which both science and marxism are ideological) strange may feel more at home with the Gramscian concepts of ideological hegemony and counter-hegemony, in which the stark science/ideology split is not so startling. On this view, hegemony is 'an order in which a certain way of life and thought is

dominant, in which one concept of reality is diffused throughout society in all its institutional and private manifestations, informing with its spirit all taste, morality, customs, religious and political principles, and all social relations, particularly in their intellectual and moral connotations.' (Williams, 'Gramsci's Concept of *Egemonia*, p.587.) I realise that I am going to the limit in extending the anti-scientism of Marx and of certain tendencies in the marxist tradition to include science itself. Much of the point of what I am exploring is to see the political consequences of that extension.

The struggle for socialist science prefigures how people should treat one another and relate to nature in a non-hierarchical and non-authoritarian world. The structure and practice of how people treat one another is called their social relations. So science mediates–ultimately *is*–social relations. Our world-view includes conceptions both of nature and society, with 'society' as a category which is more fundamental than, and more basic to, that of 'nature' (Lukács). It must follow that our science, however unobtrusively, is an expression of our social relations. Let me put the point another way. If we want to learn to talk about, and to bring into being, socialism and socialist science, then we have two tasks at the theoretical level. The first is to demystify capitalist society. Marxist writings (or at least the parts which are not scientistic) have done a good job of demystifying capitalistic society. Now we must have the imagination, the nerve and the will to do that for capitalist science. It is part of the same task, but it is harder to see and to do. We are all successfully socialised into the separation of fact and value, of science and society. Now we have to put our world back together. Modern science and modern capitalism arose as a single cosmology in which fact and value are separated and upon which modern society and its scientistic foundations were erected as a single edifice. This will have to be dismantled, brick by brick, including and especially those metaphysical foundations, since they, in turn generated the ideas of truth, objectivity, progress, rationality and human nature with which we continue to operate in science and technology.

There are concepts in marxist theory which are central to this task: *fetishism* and *reification*. Both are concerned with the representation of the relations between people as though they were relations between things. It sounds a bit strange at first, but socialist science means that we must learn to see that ultimately it is reification to treat the relations between things as though they were relations between things. I don't mean that as mere paradox: let me try to spell it out. If science is social relations, then the demystification of science entails the demystification of its reifications. In economics, the fetishism of commodities means that we see the thing–the commodity–in a mystified way and forget that it is human labour in a frozen form. Making a commodity transparent means seeing it as social relations–seeing how it came to be from nature (unqualified) by means of the process of human labour. Well, science reifies nature; it treats nature as

things without values. (In the language of technical philosophy, it banishes final causes and seeks to explain all phenomenal experience in terms of primary qualities. But it's time to move on from conducting the analysis in that language.) If we are to make transparent the values in science and make explicit its ideological nature, then we must stop treating things only as things and see them as social relations as well. Different social relations–socialist ones–are inseparable from different science, different facts, a different nature and society. A separate category of 'science' would probably, it seems to me, become unthinkable once the reintegration of facts and values was complete. But that's trying to look farther over the horizon than I can see at present.

By Stages

We can take the point by easier stages (stages many of us have travelled), from the demystification of capitalist economic relations by successive approximations, to nature itself, i.e., from the alienation at work to the alienation of reality. We have little problem in understanding that commodities are fetishised social relations. As we tell that story, we can start with raw materials and carry the analysis all the way to the factory and the shop and the consumer. We can see the production, exchange and consumption. Marx, Engels and Lukács have made transparent the formerly opaque expression of social relations as economic ones, i.e., in the mystified form of inevitable and inescapable laws of nature. Sets of human conventions are presented in bourgeois economic theory as unalterable, natural determinations, and marxism demystifies these. Now we must apply that same analysis to the laws of nature themselves and demystify the existing conceptions of unalterable natural determinations and the attendant scientism, fatalism and deference to powerfully authoritarian experts. (At this point I always have to make a ritual reassurance: Newton's laws and the internal combustion engine 'work', and I don't think the external world ceases to exist when I close my eyes.)

As David Dickson and others have argued, the same analysis applies to technology, which plays a central part in the construction of social reality. He and Edward Thompson and Andre Gorz and Stephen Marglin and others have shown that the claims of technological determinism in the development of the factory system and the division of labour, turn out to have much more to do with work discipline and authority than with anything inherent in the productive process, sources of power, access to raw materials and markets, or efficiency. And Loren Baritz, Alex Carey, Mike Hales, Harry Braverman and I have tried to generalise this critique to demystify scientific management and the management sciences. Notice that the argument is moving outward from bourgeois economics to industrial society and its products, which turn out to be social relations.

At this point in the argument we move on to various tendencies in the social sciences, from the avowedly bourgeois to the more symbolically

marxist ones which concentrate on the social and ideological and cosmological constructions of reality. The unifying theme in these otherwise diverse tendencies is the perception that social worlds are negotiated and constructed and are the products of interactions among contending interests, groups and classes. The radical critique of science can thus draw support from such disparate tendencies as phenomenology, cognitive sociology, symbolic interactionism, labelling theory, ethnomethodology, the sociology of educational knowledge and its institutionalisations (including scientific knowledge and institutions), the study of socialisation, and the critique of everyday knowledge and everyday life.

My theoretical understanding, my imagination and my morale are helped most in this way by deviance theory–the study of those who are in some respects outside the prevailing norms of the society–since it helps me to envisage (and to bring about in small ways) the replacement of a vile norm with liberated deviations. I don't think I'm alone in this, since the theme plays a large part in our popular culture and fantasies. In recent films the theme of deviance has been pervasively appealing. Deviants who 'win' in a completely individualistic way: *The Graduate, M.A.S.H., Catch 22, Paperchase, Charlie Varrick, Death Wish, Rollerball,* most cowboys. Deviant losers with whom we identify strongly: *Bonnie and Clyde, Cool Hand Luke, Hombre, Easy Rider, Steelyard Blues, Pat Garrett and Billy the Kid* (including Alias), *Thieves Like Us, California Split, Sugarland Express, Thunderbolt and Lightfood, Mean Machine, Spirit of the Beehive, Lacombe Lucien, The Man Who Fell to Earth, Dog Day Afternoon, One Flew Over the Cuckoo's Nest.* These are complemented by deviance films in which the power of the normative social forces is ultimately crushing, in which reality (cops) is totally overwhelming (= robbers): *Serpico, Chinatown, Lenny.* Then there is, finally, the appeal of helplessness films, in which the natural or occult processes consume us or threaten to: *Don't Look Now, The Exorcist, Towering Inferno, Earthquake, Jaws, The Incredible Shrinking Man* and other fatalistic Sci-fi. An analogous domain which invites analysis of its reconciling versus its potentially liberating aspects is science fiction, in which science and technology are at the centre of our ambivalent fantasies.

Here we come to the borderlands between sociology and anthropology, where the critique of the constructed conventions of *social* reality reach out to embrace all of reality. Thus, the illuminating relativism of the anthropology of exotic peoples, when shined on our own society, may make the academic epistemologists nervous, but it is heartening for ideologues of the Left, Right and Centre because they can thereby imagine a society based on their respective values. The anthropology of knowledge invites us to see our educational and research institutions as social systems, our training as, e.g., doctors and scientists, as a process of socialisation,

and our knowledge as a belief system. Instead of thinking of research labs and teaching hospitals solely as relatively congenial and efficient settings for discovering, propagating and applying natural knowledge, we must also come to see them as social institutions in which apprentices, manual workers, patients and other subjects are socialised into a belief system which we have hitherto thought to be a neutral and relatively transparent body of methodology and procedure, knowledge and therapy. The three elements–social system, socialisation, and belief system–are congruent with, mediate and reinforce (both directly and indirectly) the existing framework of order, power and ideology. In these factories for hierarchical and authoritarian ideologies, manner, matter and structure interpenetrate at all levels of theory and practice and training, including the definition and 'nature' of facts, findings, diagnoses, theories and therapies. The social relations of such institutions are the social relations of the society; so also are the things and therapies with which they are concerned. Bourgeois social sciences fail to make explicit the ideological role of the processes they interpret.

The result of this perspective is that we can see science (I always mean to include technology and medicine, but it's tedious to go on repeating them all) as part of the ideology of class societies. We can also–if we are serious utopians–see an alternative cosmology over the horizon: socialist science in a socialist society (if the category of

socialist Revolution

IN THE PRESENT ISSUE:

Editorial: Italian Communism and the American Left
Sandra Chelnov: Italy: Abortion and the Autonomous Women's Movement
The Democratic Party and the Left: articles by G. William Domhoff, Dick Flacks, and David Plotke

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'science' remains). If we are to move into that world, we must cease to believe that inevitable historical processes will see us through or that one great push will do so. 'The Crisis of Monopoly Capitalism' is not something to count on in political struggle any more than 'the proletarianisation of scientists' is in our politics. Similarly, 'the Student Movement' of the late 1960s marched round the walls of Jericho seven times and even levitated the Pentagon, but both still stand. Instead of believing that capitalism's crises or youthful voluntarism will do the revolutionary job for us, I am suggesting that we take up those aspects of bourgeois social analyses and turn them to our own purposes, whatever their authors may have intended, and use the widespread perception that social and natural realities are negotiated, constructed, conventional and historically alterable—to get on with it in our own lives and institutional settings. (What we now know is how long and difficult and slow and shattering such struggles are and how many will be pushed too far and leave the struggle, perhaps to return, perhaps not.) The social sciences which offer us these perspectives tend to keep their consequences safely in the realm of theory and interpretation and fail to confront the issue of power (or do so in a way which has no agitational intent). Surely we can recontextualise them in subversive ways in order to demystify and disrupt in the service of a human world. In so doing, we can convert the so-called 'behavioural' and 'social' 'sciences' of psychology, sociology, criminology and anthropology into human practices, thus transforming their contemplative stances into constructive subversion in our own work and our own institutions. Of course, once these changes begin the arbitrariness of the disciplinary boundaries from the point of view of human use value, becomes apparent.

The main bulwark against seeing these disciplines as freely available for radical rip-offs is their own falsely conscious deference to the natural sciences as the locus of the ideal of certainty, of hard facts and reliable methods and theories. Many people who are convinced anti-positivists in the social sciences are, at a deeper level, positivistic in their deference to the methods, assumptions and (at least potential) certainty of the natural sciences. We need to reverse this perception, to remove the foundations from both the superficial and the deeper versions of the positivists' separation of facts from values and their naive belief in the 'empirically given'. In the sociology of knowledge an exception was made of mathematics and portions of the natural sciences: their knowledge was said to be on the whole exempt from relativism in terms of the social origins and location of theories and findings. As to the question of whether or not an exception is to be made of any portion of science, the very possibility of a specifically socialist science or specifically socialist sciences is predicated in the

assumption that the answer must be: no exceptions.

Marxism

In the previous section, I was taking the argument by stages: from commodities to technology and the division of labour; to the social sciences and the social construction of social, and then natural, reality; to the anthropology of knowledge, including scientific knowledge; and finally to alternative cosmologies. Or we can move on from these pathways. When I said it is time to move on theoretically, I meant that we should stop retracing all those steps every time. We know the path, but it is a long one, and we are very tired when we get to the end, when what we really want to do all lies ahead of us, and weariness too often overcomes us just there. A better way is to get straight to the point—to miss out the bourgeois sociology and anthropology of knowledge and its setting and go straight to marxism (always reserving the right to do a bit of review if it helps in a particular argument).

Thus:

> A scientific fact appears, at first sight, a very trivial thing, and easily understood. Its analysis shows that it is, in reality, a very queer thing, abounding in metaphysical subtleties and theological niceties . . . . A scientific fact is therefore a mysterious thing, simply because in it the social character of men's labour appears to them as an objective character stamped upon the product of that labour; because the relation of the producers to the sum total of their labour is presented to them as a social relation, existing not between themselves, but between the products of their labour, i.e., between scientific findings. . . . . A definite social relation between people assumes the fantastic form of a relation between things. . . . This fetishism of scientific facts has its origin in the peculiar social character of the labour that produced them. (I:71-2)

In that passage I merely quoted the famous section of *Capital* on 'The Fetishism of Commodities and the Secret Thereof', subsituting 'scientific fact' or 'finding' for 'commodity'. The whole section reads very well when conceptions from science are slipped in place of ones from capitalist economic relations. For example,

> The recent ideological discovery that the products of labour, so far as they are values, are but material expressions of the human labour spent in their production, marks, indeed, an epoch in the history of the development of the human race, but, by no means, dissipates the mist through which the social character of labour appears to us to be an objective character of the products themselves. (I:74)

> These scientific formulae, which bear it stamped upon them in unmistakable letters that they belong to a state of society, in which the process of production has the mastery over men, instead of being controlled by him, such scientific formulae appear to the bourgeois intellect to be as much a self-evident necessity imposed by Nature as productive labour itself. (1:80-81)

I hope that you will agree that the substitution is an illuminating way of alluding to the growing marxist literature on fetishism and extending it to

the natural sciences. Here is Marx looking back over his shoulder at bourgeois epistemology: 'To what extent some radicals are misled by the fetishism inherent in scientific findings, or by the objective appearance of the social character of labour, is shown, amongst other ways, by the dull and tedious quarrel over the part played by Nature on its own in the formation of scientific theories.' (I:82) Lest it be thought that only Marx invites this substitution of the scientific for the economic fetish, here are a few (similarly modified) lines from J. Friedman on 'The Place of Fetishism and the Problem of Materialist Interpretations' from the first issue of *Critique of Anthropology*: 'Fetishism of scientific facts and theories is defined, then, as the transformation of underlying social relations of production into the form in which they appear as the subject of those relations .... Social relations of production are primary and the fetishised facts and theories are the only way in which these relations appear.' (31-2) For people in society, things are social relations. We do not encounter nature unfashioned and unmediated. Just as commodities are social relations, facts are both commodities and social relations, and science is an integral part of the capitalist mode of production.

The task of freeing ourselves from deference to hierarchical society and its science is a unified one. At the theoretical level, that task will be complete when we see that the following expressions are synonymous, when we grasp their inward meaning and realise that they represent a set of eminently alterable conventions: fetishism, reification, alienation, division of labour, private property, hypostatisation, misplaced concreteness. In the paradigm of explanation of modern science, alienation is built into the fabric of ultimate reality (or 'ontologised') by the substitution of a reified version of what we consider to be real. In our socialisation into a scientised cosmology we learn to *experience* this as the most concrete rendering of reality: this is misplaced concreteness, an ontology of reification. As David Dickson and Michael Young have helped me to see, we are socialised via the hidden curriculum of schools and in our later scientific education into 'a system for producing explanations in a particular *form*, one that can be linked to the *forms* of technology (the means of production) on the one hand, and the *forms* of social exploitation (the social relations of production) on the other' (Dickson). The cosmology of modern science lays down the metaphysical assumptions in terms of which scientists and other experts think, ask questions, evaluate answers, control nature and other people and are controlled. David Dickson sometimes calls it the 'coding mechanism' or 'generative structure'. It is very deep and abstract and not on the surface of everyday life and science, at the same time that its forms define and generate the rules, vocabulary and definitions of what we experience as the stuff of experience itself, of facts, of theories, of sciences, of worlds, of the cosmology: the logos of our cosmos is the

scientific cosmology. We learn it by living it.*

Once we begin to think of science as part of the problem of freeing ourselves from the cosmology of hierarchical societies, we get two immediate benefits. The first is that science no longer has a privileged place, inducing deference and fatalism, serving as a spurious reservoir of authoritarian claims by experts. The fruits of that demystification grow and deepen the roots of our socialism as the awareness penetrates through our attitudes, beliefs and 'certainties'. The second benefit is that all sorts of alliances between science and power get demystified, and radical critiques of them become apparent.

This is, of course, not a new insight from the opposing point of view of the wielders of power. In one of the earliest theoretical apologies for the vile system under which we live, Andrew Ure's 1835 treatise on *The Philosophy of Manufactures or an Exposition of the Scientific, Moral, and Commercial Economy of the Factory System of Great Britain*, we find the following conclusion to a long, rhapsodic exposition of automation in spinning: 'This innovation confirms the great doctrine already propounded, that when capital enlists science in her service, the refactory hand of labour will always be taught docility.' (368) The same expansive enthusiasm for using the reifications of science and technology to produce the reification of people shines through the theoretical and autobiographical writings of apologists for successive developments of industrial capitalism, for example, Adam Smith, Josiah Wedgwood, W. Thompson, Charles Babbage, F.W. Taylor, Elton Mayo, Henry Ford, Alfred P. Sloan Jnr. (GM), Thomas J. Watson (IBM), Harold Geneen (ITT), Eric Trist—covering the two centuries from 1776 to the present. The opposite approach to the role of science in industry lies at the heart of Marx's critique of the relations of

DARE TO STRUGGLE, DARE TO WIN,
DARE TO SNUGGLE, DARE TO GRIN.

*Lest it be thought that these claims can find no warrant in marxist exegetics and that I make it up as I go along, have a look at Lucio Colletti's lucid 'Introduction' to the Pelican edition of Marx's *Early Writings*, especially pp. 37-8, 47, 49, 50, 54; cf. pp. 26, 33, 39 and, for a fuller development of a relational interpretation of Marx's synonomy, see Ollman's *Alienation, passim* and his 'In Defence of "Internal Relations"', in which he points out that although Marx sometimes distinguishes things from relations, at another level he characteristically treats things *as* relations. See also Arato, *Telos* 11, p. 25; Hernandez, *NLR* 72, p. 103; Eccleshall, *Radical Philosophy* 11, p.9. Finally, if my conceptions of ideology as a world view, of alternative cosmology and of prefiguring seem weird and without precedent in marxist writings, try thinking of them as developments from Gramsci's critique of scientism in marxism in his conceptions of 'ideological hegemony', 'counter-hegemonic world-view' and 'prefigurative struggle'. See Boggs, G. Williams and Gramsci, among other writings in the bibliography and resources list.

production under capitalism. One statement of his conception of the role of science in this system is:

> [In capitalist society] all means for the development of production transform themselves into means of domination over, and exploitation of, the producer; they mutilate the labourer into a fragment of a man, degrade him to the level of an appendage of a machine, destroy every remnant of charm in his work and turn it into hated toil; they estrange from him the intellectual potential of the labour-process in the same proportion as science is incorporated into it as an independent power; they distort the conditions under which he works, subject him during the labour process to a despotism the more hateful for its meanness. (*Capital*: I:645; cf. p. 361)

The common matrix of the social relations of production, including nature, science, human nature and industry is already clear, as Colletti shows, in Marx's *Economic and Philosophic Manuscripts* of 1844:

> In the section entitled "Private Property and Communism" Marx describes how "man's relation to nature is directly his relation to man, and his relation to man is directly his relation to nature", and this should be placed alongside his subsequent remarks on industry: "*Industry* is the actual historical relationship of nature, and thus of natural science, to man . . . the history of *industry* and industry as it *objectively* exists is an *open* book of the *human faculties* and human *psychology* which can be sensuously apprehended." That is, just as inter-human or social relationships are inconceivable apart from man's relationship to nature, so his relationship to nature (and hence industrial production) is inconceivable apart from men's social relationships among themselves. (Introduction to Marx's *Early Writings*, p.56)

Our conceptions of these issues are, as well, part of a single problematic matrix. As Murray Bookchin points out, both people and nature have always been the common victims of hierarchical society; the concept of dominating nature emerged from the domination of some people by others. (*Post-Scarcity Anarchism*, p.17). Once we transcend the separation of science from society, we can see that having demystified commodities in the economy as well as efficiency, authority and technology in the factory, we must move on to demystify science in order to reunite nature and humanity.

Science and the Division of Labour

In some areas it is relatively easy to see that science is social relations. Once we demystify the myth that in a lab 'We are all a team working together', we can see the caste and class structure of the workbench and the tearoom. We learn to notice the structures of who can tell whom what to do, who makes decisions about appointments and tenure (i.e., who has the power, however much 'consultation' may occur), whose names go on papers (and in what order), who decides the direction and priorities of research, who gets paid how much and on what length of contract. Science perfectly reflects the existing division of labour in a class, hierarchical and authoritarian society. How many of us know (much less alter) the spread of pay at their place of work; how many have an equal say

about appointments; how many take it in turns to scrub toilets or even wash glassware in a lab or empty bedpans in a hospital, much less fix the tea and make and serve meals? These may seem merely naive and utopian questions: I intend them to be both, but not merely so. We may have become aware of and begun to change aspects of the division of labour in the family as a result of the women's movement, but I think it's a rare scientist who has applied the same attitudes and critique to his or her place of work, as are by now becoming commonplace when thinking about the division of labour in the home and in industrial factory settings. Something seems special, exempt from critique, about the hierarchical division of labour in scientific and medical settings. At the cinema we can laugh sympathetically with Charlie Chaplin tightening nuts at speed in *Modern Times* or be moved by the woman in *Family Life* monotonously putting chocolates in a box. But how many of us fully grasp that the production of scientific knowledge involves the same hierarchical division of labour and proliferation of sub-specialties as the production of any other commodity? Yet if you ask a scientist almost anything, the reply will be, 'That's not my field'. Specialisation and fragmentation of knowledge and research—and journals—grow and grow. By 1967 there were 26,000 scientific and technological periodicals; there were 4 in biochemistry in 1900 and 201 in 1960. Even the division of labour among summarising and abstracting journals is getting out of hand.

"When I want your advice I'll beat it out of you!"

The power relations which we deplore in Beynon's *Working for Ford* exist closer to home, as André Gorz has recently stressed:

> The subordination of the laboratory technician or anonymous researcher to his or her boss, and of the latter to the head of the research department, is not very different, in most cases, from the subordination of the assembly-line worker to her or his foreman, and of the foreman to the production engineer, etc. . . . The hierarchy in the production of science is as oppressive as that in factory production.

Science reflects, reinforces and, moreover, is an integral part of the social division of labour, the capitalist relations of production and capitalist power politics. ('The Scientist as Worker', pp.15-17) A central aspect and a pre-requisite of solidarity between scientists and other workers is that both come to see their involvement in a common political and economic structure—the general one of a commodity society and the specific one of a factory for producing commodities and their attendant social relations.

Another area in which it is relatively easy to see science as social relations of the same sort as in other parts of the economy, is in the funding and conduct of research, but this can be done at very different levels. The arguments for seeing science as responding to the needs of the people's rulers rather than to those of the people themselves, have been well-illustrated in the critiques of the Rothschild 'customer-contract' government proposals in Britain as well as in specific areas of research, for example, sickle-cell anemia in America and sensory deprivation in Britain and Ireland. Financial pressures on research institutions from Science Research Councils and other funding agencies are increasingly causing a shift to areas called 'fundamental applied science' where the ideological/political component is becoming more explicit through direct attempts to cater for the needs/demands of a market economy. Science cities oriented toward research-based industry, e.g., in the Boston/Cambridge area and now being built in the other Cambridge as a speculative college investment, are tangible signs of the growing integration of formerly-ivory towers with high technology industry. No one should oppose research based on use-values, but the emphasis seems to be on exchange-values in these cases.

Bourgeois fashions and capital's requirements in research and the technology of repression and of consumerism are familiar and important topics. So also is the ideological nature of certain other areas of research, but here, as in work on the hazards of work, it is often possible to stop at the level of use/abuse and fail to see that the whole underlying rationale is ideological. Thus, in the British Flixborough disaster in which 28 people were killed and 150 injured on a Saturday, the whole process for making caprolactam was ideological. The official enquiry blamed a dogleg in a 20" temporary bypass pipeline carrying cyclohexane past no.5 storage tank. There was said to be no failure of management even up to the level of the board of directors of Nypro UK Ltd. The 'modifications were the real root of this' said the Chairman on BBC TV, and the explosion was explained

as 'a series of errors unlikely ever to be repeated.' But this whole process for making Nylon 6 was based on the need to get round a rival firm's patent, even though the synthetic route was highly explosive. Not, therefore, a problem of careless maintenance: the whole basis of the plant, its siting, its product, and its processes were manifestations of capitalist ideology. An analogous critique of the Seveso disaster in Northern Italy could be made.

Analogous things can be said of the so-called 'scientific' research on IQ. As Les Levidow is showing, the point is not merely that the concepts of race, heredity, and environment and their relative proportions, are ideological and that the statistical methods are dubious and the selection of tests and cases biased. The deeper issue is the ideological basis of the whole set of assumptions projected onto (human) nature about ordinal, meritocratic, quantitative and competitive intellectuality, whether seen as a single factor '*g*', whether 'convergent' or 'divergent', whether measured by culturally or linguistically biased tests or not. 'Such assumptions reify a bourgeois social relation, "intelligence", as a "thing", i.e., as a natural form of private property possessed in varying quantifiable degrees by all human beings and produced proportionately in relation to other "things": genetic endowment and environmental conditioning,' (sez Les). In my utopia such traits are not experienced: the collective works together with mutual aid until everyone is satisfied.

In all these cases–in technology and in science–the ideology establishes not only the details but the conceptual framework within which the work is conceived.

What Needs Doing–Theoretically?

In the previous sections on 'Science as Domination' and 'Science and the Division of Labour' I have been discussing aspects of the social relations of science which are not familiar to most scientists who are also radicals in their politics but which benefit from being considered in the same framework as the critique of the factory. However, though unfamiliar, they are not particularly novel or unpalatable for socialist scientists, even though many have not as yet seen the need to act by joining trades unions and actively struggling with other workers to overthrow capitalism. The deeper claim that the theories and findings and world view of science should be seen as social relations is, of course, much more unfamiliar and challenging. I don't know what other meaning to attach to the conception of a socialist science, and it is intrinsic to that position that the theoretical vision is inseparable from bringing it into being by prefiguring the end in the means in the work and lives of radicals. That is the revolutionary meaning of saying that real history is not about ideas *or* machines *or* people: it is about where they meet, about practice. In the light of the unfamiliarity of the conception that science is social relations it will be hard for many radicals to move to that position from the one I have been reviewing, in which the social

relations of science are like other social relations in a capitalist society. How, then, can we make it more accessible? It may help to connect it to a controversy which is more familiar: the philosophy of nature of Herbert Marcuse and the criticisms of it. His conceptions of science, of nature and of the necessity to change them in order to bring about liberation, are most forcefully expressed in chapters 6, 7 and 9 of *One Dimensional Man*. Many of the controversies about science and ideology in recent years are importantly related to the issues which he discusses there, e.g., relevant work by Habermas, Schroyer, Schmidt, Leiss, Cohen. Marcuse is certainly the fountainhead for many aspects of recent libertarian views on science and ideology. It may therefore be useful to give a sharp criticism of his position as a way of helping sceptical comrades to find their critical bearings, and also as an introduction to the theoretical tasks imposed by this perspective.

It is a thesis which my argument shares with Marcuse's that 'the scientific undertaking itself projects a specific set of ideological and societal assumptions.' In his essay on 'Natural Science and Human Theory: A Critique of Herbert Marcuse', Peter Sedgwick complains that Marcuse draws his examples from easy prey:

> The only examples he quotes from actual scientific work come from the conformist wing of applied sociology, a field where the social values of the researcher obviously have a specifically determining role. Investigations from physics, chemistry, biology or psychology are never instanced in the text. Without some such exemplification, Marcuse is hardly justified in speaking of a general "shift in theoretical emphasis from the metaphysical 'What is . . . ?' to the functional 'How . . . ?'." If he had taken a look at some general texts in physics or biochemistry, for example, he would have found that the actual objective language in which sub-nuclear particles or protein molecules are discussed suggests that the scientist's continuing concern is, as ever, with a highly *non*-metaphysical "What is . . . ?" Until he can provide some harder detail (similar to that, e.g. which links medieval scientific concepts with the total medieval world-view), Marcuse's intriguing suggestion that in a liberated society "science would arrive at essentially different concepts of nature and establish essentially different facts" is utterly vacuous. (175)

Here, then, is a trenchant challenge. In the decade since Sedgwick wrote, a lot has been published to meet his call in the areas of psychology and biology, and some suggestive work has been done in mathematics and physics by Bloor and Forman, though their analyses are limited by their stopping a long way short of marxist analyses. Nevertheless, Sedgwick's challenge still stands. It brings us to the holy of holies—to the point where those who don't want to radicalise their science and their lives always go fastest. 'What about physics?' 'What about molecular biology?' One feels frog-marched up to a fractionation column, an ultracentrifuge or a linear accelerator: 'OK, smartass, what's ideological about that? Show me *my* science, *my* findings, are mediations of social relations.' At the conference where an earlier version of this paper was first presented, an old left communist professor of physics made a snide joke about over-enthusiastic pioneers in new cities in Siberia claiming that revolutionary zeal could change

the second law of thermodynamics, while a liberal professor of molecular biology claimed that there are still congenial labs in which one can work on relatively untainted research problems. But at the same conference Luke Hodgkin on physics, Simon Pickvance on molecular biology, Mike Cooley on trades union struggle and Althea Jones on scientific imperialism, made contributions which begin to answer Sedgwick. In fact, Althea Jones even taught us about colonialism and deference *in* scientific apparatuses. Even so, the demand is fair and sets a hard task for analysis and struggle, though it is worth noting the alacrity with which it is made, the framework for an acceptable answer, and the criteria which are self-serving and positivist: 'Until you convince me, I'll go on cultivating my garden, my status, my salary, my power and patronage and loving it.' We must ask, in a hectoring way if necessary, 'Why spend so much time and energy attempting to exonerate physics if special claims aren't (however implicitly) being based on it for ultimately scientistic purposes?'

In spite of all the questions we may want to ask in return, the challenge remains important and brings us to another sense in which we have to move on. We need to conduct the theoretical analyses—not because they require it and not via the traditional history, philosophy and sociology of science and technology, but—for our own purposes as marxist revolutionaries. We must analyse ideologically the scientific world-view, particular sciences, particular traditions, particular theories and particular diseases, showing how they mediate and come to reinforce the formations and socio-economic structures of particular epochs and settings. In his criticism of Marcuse, Sedgwick grants the link between medieval scientific concepts and the total medieval world-view. We must analyse that same connection in the succeeding period, since it was the one in which the metaphysical foundations of modern science were being laid. Radicals—and even radical scientists—who are fairly well-up on what Lacan or Althusser or Mandel or Colletti was thinking last Wednesday, who feel that they should know something about pre-capitalist economic formations—still know little or nothing about the metaphysical assumptions of the modern world-view and have no sense of needing to know anything about them or their ideological role. In order to change this situation and meet the challenge about the development and deepest assumptions of modern science and society, we must move on to make more subtle and more political the existing marxist analyses of the so-called 'Scientific Revolution'. For example, we should show the structural congruence between the political theory of possessive individualism and the development of seventeenth-century atomism; the identity of the movements which enthroned the commodity form and exchange value at the expense of use-value on the one hand and enthroned modern scientific explanations and banished purposive explanations on the other; the ideological compromise inherent in Cartesian mind-body dualism; the relations between the 'mechanical

philosophy' and the development of capitalism and the protestant ethic; the relationship between *forms* of analysis in science and the forms and stages of economic activity, e.g. in the histories of mathematics and statistics. We must also look at the claims and the politics of the alternative cosmologies of, e.g., the Hermeticists, the alchemists, the millenarians, the neo-Platonists and study the ideological struggles which were involved.

These are not new topics for historians, even marxist ones. But they are new ones for the second generation of the New Left, who look to history with a transcendent eye and with a richer framework of interpretation than the 'vulgar marxist' theory of one-to-one correspondence between the intellectual and cultural 'superstructure' and the socio-economic 'base'. We are interested in history for the agitation we can get out of it, for the knots it can untangle about the origins and structure of our present forms of deference and mystification. For example, the critique of the banishment of final causes in science helps us to understand and combat current bureaucracies; the critique of Cartesian mind-body dualism helps us to struggle against medical hegemonies and to develop our sense of being a person. We look to history for lessons and warnings and morale-boosting precedents—all thoroughly disreputable motives for all but a few old left scholars. And the warmth of those few shines through their work so that they can speak directly to younger people; I am thinking particularly of E.P. Thompson, Raymond Williams and Stuart Hall. Conversely, a new brittleness and dessication radiates from some of the certainties of their putatively 'New' Left successors.

Moving on into the eighteenth century, we need to examine the links between biological and medical theory on the one hand and the development of social and political institutions and philosophies, looking deeper and more overtly politically than, e.g., Michel Foucault. Looking at diseases in particular (in this and later periods) Karl Figlio suggests examining the relationship between the 'recognition' of a disease and the social niche for it—a convergence between role theory in illness behaviour and the socio-political construction of reality. In the late eighteenth and nineteenth centuries the relations between biological and social and economic theories in the context of radical and revolutionary movements, have begun to be investigated, as have later developments in evolutionary, psychological, imperialist and entrepreneurial theory, e.g., from Malthusianism to social evolutionism via Darwinian and Spencerian evolutionism, and from the Idéologues and Lamark to French biological, psychological and social theory and clinical medicine. As we consider the ideological nature of science we shouldn't forget that the concept of ideology itself is also historical. The original Idéologues were people in France at the end of the eighteenth century who were posed psycho-physiological problems (via the 'mind-body interaction') when the blade of the guillotine fell. They saw it as their general task to subject the ideas of science to their science of

ideas–idéologie. Successive layers of perjorative connotation were added by Napoleon's opposition to their influence and then by Marx and Engels' analyses, which almost led to the equation of ideology with false-consciousness. Similarly, 'positivism' was originally a term and a secular religion coined by Auguste Comte, who was greatly influenced by physiology and phrenology. Emile Durkheim's classical treatise on *The Division of Labour* owed much to Comte, to his master Saint-Simon and to Herbert Spencer's theories on the 'physiological division of labour'. American reactionary social theory, e.g., Talcott Parsons, was inspired by an eminent physiologist, L.J. Henderson, who was able to lend strength to his ultra-conservative reaction to radicalism in the American depression by serving up Pareto's fascistic social theories buttressed by physiological analogies. I know that I'm sketching; all I want to convey is that at every level there are important links between scientific traditions and the growth of urban industrialism and the division of labour (in France, Germany, U.S.A. and Britain) which must be made more explicit and then tied firmly to the development of modern sociology, anthropology, economics, psychology, ethology, physiology, medicine and biology. After all, Nobel Prizes have

I Was Confused Until I Read This . . .

In many ways the needs of senile people are like those of the feebleminded who make up the lowest (intelligence-wise) two per cent of the population. Both, as long as they can be useful, are best off living in their own homes. Indeed a great deal of the world's most boring and unpleasant work is done by people with low I.Q.'s. When helped to adjust to their menial jobs, they can be both useful and content. But when caring for them becomes an unbearable strain on their families, they are better off in institutions.

from *The Inside Story: psychiatry and everyday life*
by Fritz Redlich, M.D., and June Bingham,
NY: Vintage, 1953.

been awarded to the creator of pre-frontal leucotomy (Moniz), to a reactionary theorist of reactionary theories of brain function (Eccles), and to an ex-apologist for Hitlerian racism who won fame as an interpreter of nature's inevitable hierarchical ways and who applies the same framework to the interpretation of young radicals and society's ills (Lorenz). Various forms of biologism continue to thrive, the most recent being E.O. Wilson's *Sociobiology*, hailed in the London *Sunday Times* as 'a new branch of science' (6 June 1976) and Richard Dawkins' *The Selfish Gene*. All of these manifestations of social Darwinism seek to turn our gaze from human praxis toward biological determinants.

Once we have removed our blinkers and looked deeper into the constitutive role of social formations in science and the dialectical relations between science and social formations at every level, we must also reconsider the alternative visions of, e.g., William Blake, William Morris, John Ruskin, A.R. Wallace, Peter Kropotkin. It is as well to remember that there have ever been alternative cosmologies and also unsung radicals whose histories have been minimised or ignored. In Dallas I studied more Texas history at school than the U.S. and the rest of the world put together, but it wasn't until recently when I read my son's copy of *Harvey Wasserman's* beautifully biased paperback *History of the United States* that I learned that in my home town there had existed one of the earliest and most effective radical newspapers and the earliest farmers' revolt against the marketing cartels. Similarly, the discovery in the wake of recent agitation that real black history was lost or stolen and women's history hidden, should encourage us to look both backwards and more broadly for solidarity.

Analogous studies have been conducted in the bourgeois sociology of knowledge with respect to the development of quantum mechanics and molecular biology. We must radicalise them. Similarly, the gamut of disciplines in the second industrial revolution—scientific management, operational research, cybernetics, computer science, systems theory—along with attendant developments in mathematics, await ideological critique, just as do their pallative expressions in industrial relations: job enrichment, workers' participation, industrial sociology and psychology. Moving closer to home, their radical critiques which are helping us to demystify the social relations of science and technology must not remain unexamined. The study of the labour process is itself becoming a candidate for a scientistic radical orthodoxy. As David Albury is showing, we must not consider our sources of radical insight to be immune from political scrutiny—the work of Gorz Marglin, Braverman. When we learned from Gorz that scientific labs should be seen from the perspective of the factory, we must return to discover the roots of the mediations which give scientific workers their false consciousness. When we have learned from Marglin that discipline was more basic than the needs of the mechanical processes of the new technology in the industrial revolution, we must look again at the technology and convert it

into social relations. The history of technology is not a history of gears and mules and jennys alone: it is the history of choices and of practice. When we have learned from Braverman how pervasive the reification of the labour process has become, we must return and study the history of struggle and generate strategies for subversion.

Do we look at the past as though the present was not available for comment? No, we do so because these conceptions are alive in the present, but their oppressive political roles and ideological meaning are somewhat less difficult to discern if we analyse them by way of the unravelling of historical study; moreover, epochs from which we have some of the perspective of distance, help us to see more clearly where and how to attack in our own. Finally, showing that ideas and institutions and structures of social relations in other forms, have histories, helps us to recall that they are humanly created conventions which can be un-made by other people. They were thought up, created or 'discovered' by particular people in particular places at particular times. The weight of tradition *can* be lifted, and analysis can help us take its measure. Failure to do so in the 1960s produced the painful false euphoria which led radicals to believe that all bourgeois institutions are paper tigers, and many of us are pretty chewed up as a result.

I'll just mention one or two other examples of theoretical work which can help to demystify the ruling ideology and to contribute towards confidence that once a set of conventions can be seen as such, another set can be fought for. We need to look much more closely at the prevailing ideas of health, disease, adaptation and maladaptation and at particular aspects of the medical model and particular diseases. We think it not very controversial to consider Victorian fainting and Viennese hysteria as reflections of the lot of women in those societies. We must vigorously pursue feminist analyses of a current analogue—anorexia nervosa. Similarly, we must develop a medical sociology which looks at the relations between medical knowledge and medical hierarchies.

Theorising Our Experience

Now, who is to do all this? I know someone working on some aspect or other of very topic I have mentioned. More importantly, perhaps, a growing number of them are not experts or professionally employed in the history, philosophy or sociology of science but are working scientists or people trying to live in non-conventional ways, who are attempting to break out of their positivist careerism and see the political nature of their work (or former work) and its setting. After I'd been doing this sort of thing for over a year I returned to an academic seminar in a department where I'd worked for a decade. I could feel the constraints closing in on what I felt able to say and even get myself together to think. The conventions of the academic division

of labour and the pseudo-neutrality of discussion—astringently removing one's values from discourse to remain as vapours in the atmosphere—reasserted themselves with no trouble. Non-specialists are doing something to break down the existing division of intellectual labour, in which it's no accident that science and its social and political relations are studied in different departments and often in different institutions and in different ways, and this occurs in a way hermetically sealed from the rest of everyday ('private') life. In looking at their own research and settings, those conducting such studies are not becoming experts in a new meta-discipline. Rather, they are (often working collectively) learning to theorise their own experience. This seems to me to be another important respect in which the second generation of New Left radicals differ from their predecessors. What they have to say has to do with their own struggles and ambitions, their own intellectual, social, sexual, class and familial settings. They are breaking out of reading habits which consisted of a few key, highly specialised journals, one or two abstracts, plus 'cultural leavening' with *Nature, Science, New Scientist* and perhaps *Scientific American*, and are reading other things which aren't escapes from their work but attempts to integrate that context with their politics. That is, they are attempting to make sense of their own experiences, to interpret them as part of a set of relations. As François George has rightly pointed out, 'The division of labour is, first of all, the prohibition of access to the totality.' (*Telos* 18, p.59)

We have to face the experience that becoming aware of the contradictions in scientific work is a painful process and that having embarked on a programme of theorising their experience, many people slip away, dragged down, demoralised, discouraged, defeated, dropping in. The problem of not pushing too far is very acute all along the front of the left, and providing sufficient support and solidarity to sustain commitment is a large task to which we have to devote more thought, caring and energy. At the personal level it is the problem of keeping collective work going in a way which is sufficiently rewarding and sustaining to compensate for the heightened contradictions in the rest of life.

Complementing this problem at the theoretical level is the need to make widely available a steady diet of counter-course materials for the sciences, technology and medicine—annotated reading lists for use by working scientists to bring to bear on their own work and settings. Historical, philosophical, politico-economical and other explicitly marxist writings must be produced, reproduced and critically interpreted. This, of course, is one of the main justifications for the existence in Britain of the *Radical Science Journal* and other radical theory publications and for their listing one another's contents and keeping in touch through the Radical Publications Group and disseminating their work more widely through the Publications Distribution Co-op. The aim is not to reproduce the existing division of labour and narrow distribution of publications. We want to fight against isolated specialists

producing and reading narrow, though nominally radical, journals in each field.

Which Marxism?

Once we move on from the use/abuse model, the bourgeois social sciences and the sociology of knowledge and go beyond the social relations of science and social relations in science, and seek to approach radical science as marxists, we discover that our troubles are only beginning. Anyone who is still awake and is in rapport with the spirit of my argument won't be surprised at this point, since it would only be a new version of scientism to claim that there is a unique, correct answer to the question, 'Which marxism?' One's reading of Marx, like one's philosophies of nature, science, individuals and society, depends on one's socialisation and class and hence one's essentially political and ideological perspectives. Of course, to say that is to reject (notice that I don't say 'disprove' or 'show to be incorrect') those readings of Marx which make a sharp distinction between science and ideology and replace the authoritarianism of science allied with capital with the authoritarianism of science allied with a vanguard party. There are a number of interpretations of marxism which seek to base themselves on scientific certainty, beginning with Engels' more emphatic claims for 'dialectical materialism' and extending through Stalinism and its current theoretical scientism in the work of Althusser and his growing body of interpreters and followers. I am not suggesting that we have nothing to learn from this tendency but am pointing out that the separation of the early 'anthropological', 'humanistic' and 'ideological' writings from 'mature', 'objective' and 'scientific' writings cannot be squared with the thesis that science *is* ideological. Put another way, if we could pay sufficient attention to the role of the sciences in serving and providing conceptual support for what Althusser calls 'Ideological State Apparatuses', we would find his distinction between scientificity and the ideological, unravelling until it is clearly seen to be merely the yarn that it is.

There are, of course, other claims for 'scientific' support for different readings of Marx. In the week during which I was preparing this, I turned to the AgitProp page in London's *Time Out* and found the following notice for Friday: 'Marx Memorial Library Spring programme starts with a lecture by Maurice Cornforth on "How Marxist Philosophy has its Basis in the Sciences" Adm. Free'. Thus, the orthodox Communist Party author of a three-volume treatise on *Dialectical Materialism* can quieten our uncertainties. I would argue that for a socialist the problem is the reverse: how to bring about a situation in which 'scientific' philosophy has its basis in marxism. I should also like to mention that various revisionist tendencies leading to the 'democratic socialist' position of parliamentary parties, also lay claim to a scientific basis for their

socialism. Indeed, the original marxist revisionist, Eduard Bernstein, claimed that his doctrine of *Evolutionary Socialism* (1899) was based on biological evolutionism, and it was on this foundation that the German Social Democratic Party was founded (1898). G.B. Shaw and the British Fabians found the same arguments appealing, as did the first Labour Prime Minister, Ramsay MacDonald. Biological evolutionism was claimed as the solid foundation for quite a range of political positions–Kropotkin's Russian anarchism, Hitler's National Socialism, Mussolini's Fascism, British Imperialism, American Robber Barons, etc., etc.

But, you will say, the point is to determine which of these claims is the basis for the 'correct line'? Behind this question lies the asserted need for a basis for imposed discipline, and alongside that lies the fused metaphysical/psychological need for ontological security. Without theoretical unity and discipline with an authoritative basis, how can we bring about socialism? My own answer to this cluster of closely-related problems is that imposed authority cannot bring about what I intend by socialism, so the development and propagation of a 'correct line' loses its hegemonic appeal. Ways to achieve socialism and the range of acceptable values and priorities within a socialist society require as permissive an atmosphere and framework as is consistent with the task of destroying capitalism and constructing socialism. I find a close affinity between the search for a 'correct line' on the one hand and the claims for 'scientific socialism' on the other. These, in turn, go hand in hand with competitive, dismissive and manipulative political processes on the Left which reproduce the very hierarchical and authoritarian structures and attitudes which we are trying to transcend. So, I am arguing against those versions of marxism which claim to be scientific, and I want to demystify what I take to be their scientism–a scientism which provides as spurious a basis for experts and authoritarians on the Left as it does in bourgeois societies and their nominally socialist hierarchical counterparts.

We are therefore left with the problem of generating our practice from experience instead of from the guidance offered by a 'correct line'. If we could spend a fraction of the energy gaining and theorising that experience as we do in arguing about 'conjunctures' and the like, we'd be on our way. I have spelled out my conception of the relationship between socialist science, the problem of ideology and the question of 'Which marxism?' as sharply as I can in the hope of making the debate on these issues an explicit one. My experience has been that certain theoretical and other sectarian advocates react to libertarian positions and discussions of science and ideology as though there is nothing to discuss and much to dismiss as snidely and offhandedly as possible. This, of course, can be seen to flow naturally from certainty. My point–which follows from my position–is to attempt to get it granted that there is something to debate. If there is nothing to debate on this front what follows below is pointless, since the conception of an alternative cosmology and the importance of pre-

figurative struggle embodying the ends in the means, become superfluous luxuries (an 'unscientific humanistic problematic', I think it's called) which socialists, in their urgent need to 'seize power' as 'efficiently' as possible, cannot afford. The sort of exploration I have in mind is a lot messier and is caught well in the matter and manner of the following passages from Christopher Gray's anthology of Situationist writings, *Leaving the Twentieth Century*:

> All the main tactical and strategic debates between different groups of revolutionaries, all the possibilities they neglected at the time, should be re-examined: re-examined in the light of the failure of the whole traditional revolutionary movement. Marx is obviously the first person whose thought must be rediscovered; nor should this present much difficulty in view of the extent of the documentation and the enormity of the lies that have been told about him. We must also reassess the attitude of the anarchists in the First International, Blanquism, Luxembourgism, the Council movement in Germany and Spain, Kronstadt, the Makhnovists, etc. etc. Nor should there be any mistake about the practical importance of the utopian socialists. Nor, as should be obvious, is this just a question of a whole lot more books to read. Its sole purpose is to help in the construction of the new revolutionary movement–the new revolutionary movement of which we have seen so many signs over the last few years, including last but not least ourselves. It will be utterly different. We must understand these signs by reference to the classical revolutionary project, and vice versa. We have to rediscover the history of the movement of history itself, which has been so well concealed and distorted. Besides, when all is said and done, it is only the revolutionary project–plus a few experimental artistic groups which are, in any case, generally pretty closely linked to it–that offers any hope of truly living at all today: which allows us to take an objective interest in modern society and in the possibilities it contains.

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> There is no other way to be faithful to, or even to understand, our comrades of the past than to reinvent the problem of revolution. Why does this seem so difficult? Starting from the experience of a free everyday life–it isn't so difficult as all that; and moreover it seems to us that a number of young people today are quite acutely aware of this. And to feel it strongly enough enables us to rediscover, to redeem, *our own lost history*. It is not difficult for the kind of thought which is prepared to question everything that exists. It is not enough not to have *abandoned* philosophy, as almost all philosophers have–or not to have abandoned art, as almost all artists have–or not to have abandoned real opposition to *contemporary reality,* as almost all political activists have. And those who have not abandoned philosophy, art and politics will find that all three lead to the same transcendence. It is only specialists, whose individual power depends on the power of a whole society of specialisation, who have abandoned the *critical* truth of their various disciplines in order to enjoy the more positive wages of their *function.* But all real forms of research flow together into one totality, just as the people will get together one more time to try to escape from their prehistory. (pp.42-3)

Experiencing Our Theories

If we turn to the question of what needs doing in practice, I want to argue that we must not only learn to make our lives and politics more coherent and attack the division of labour by theorising our experience. We must also develop an alternative social and natural cosmology which we strive to bring into being by experiencing our own theories. Thus, another way of putting the dialectical relations between theory and practice so that it embraces the essential notion of prefigurative struggle is to say: theorise our own experience and experience our own theories. Among the experiences we must learn to theorise are our theoretical experiences and their relations with our research and teaching, our trades union, our social, sexual, familial and most intimate experiences. In order to theorise those experiences, we must be in touch with them. That is, we must see the role of a vision of a socialist totality or counter-hegemonic world-view and try to implement aspects of its coherence *as* we attempt to dismantle the reifications, fragmentations and alienations of the existing cosmology and the lives it imposes upon us. The conception of a socialist science seems to me to lead directly to a call for this sort of cunningly utopian behaviour. Once we move from the belief that science is value-neutral, we must ask what values it involves. Once we move from the abstract relativism of the bourgeois sociology of knowledge, we are in the realm of competing ideologies which embrace all departments of knowledge, belief and living and are mediations of class struggle. Philosophies of nature, human nature and society are sets of conventions elaborated in the service of hegemonic sets of human values and social relations. People conceived of and shaped nature and society in particular ways as a result of their practical activities. 'As individuals express their life, so they are. What they are, therefore, coincides with their production, both with *what* they produce and *how* they produce.' (*German Ideology*, p.32)

If we want nature and society to have a different shape, we must make different productions and in different ways. Not only is science not neutral,

but its role in bolstering and mediating authority and deference also helps us to see the need to address ourselves to cosmology itself. Once again, ideology is not—as is so often claimed by various marxists and certainly by bourgeois apologists—distortion. It is a hegemonic world-view embracing all of nature, life and society. The philosophy of nature of modern science and society is not an exception to that claim but an example of it, and positivism is its most potent social expression. Positivism claims to separate facts from their network of relations, evaluations and meanings. People who separate facts from values, science from society, and claim that their thinking is not ideological, are positivists. As E.A. Burtt has pointed out,

> There is an exceedingly subtle and insidious danger in positivism. If you cannot avoid metaphysics, what kind of metaphysics are you likely to cherish when you sturdily suppose yourself to be free from the abomination? Of course, it goes without saying that in this case your metaphysics will be held uncritically, because it is unconscious. Moreover, it will be passed on to others far more readily than your other notions, inasmuch as it will be propagated by insinuation rather than by direct argument. (p.225)

Burtt was putting this point in his classical study of *The Metaphisical Foundations of Modern Physical Science.* We learn capitalist metaphysics in the same way as we learn all our other assumptions, and there is no point at which we will reach the 'end of metaphysics' any more than we had reached the 'end of ideology' when the agents of the CIA announced that we had in the early 1960s. Once we realise the inescapability of metaphysics at every level of experience, including scientific experience, we should relate it to the question of the evaluative and purposive dimension in science. Burtt says, 'Now it may well be that science, despite its rejection of final causes, reveals the presence and functioning of values in the fundamental categories it selects and the ways it applies them. If so, then an adequate scientific metaphysics will not be able to manage without teleology in some form, and it becomes a question of first-rate importance what that form is to be.' (308)

It may appear that I am carelessly and repetitiously drifting back into bourgeois philosophy of science. My point in reverting to Burtt's analysis of the origins and foundations of the modern scientific world-view, is to remind us that the critique of the deepest assumptions of scientific metaphysics leads directly to the problem of values. Now the next move is the big one. Once that problem is before marxists it can only be seen in terms of ideology, and we are then faced with an urgent task. If nature does not exist for us (in that we cannot relate to it) value-free, then we bring values to nature; we create and discover them in our interactions with nature. This is a process which calls for us to bring a world-view into being which competes with and replaces the existing cosmology of science and society. The critique of the most abstract features of scientific metaphysics here unites with the most concrete call for a liberating politics of everyday life at work, in the home and in other social relations. In order to attack

repressive structures, we must learn to see them and to see how deep they go into the innermost recesses of our most abstract theories and of our interpersonal and psychological being.

Stock-Taking Interlude

I'm starting to lose my nerve, so I'd better try to stand back for a bit. I think that what follows has real strengths on the side of demystification but profound weaknesses on the side of specific practices which will bring into being an alternative cosmology or counter-hegemonic world-view. Much more development of strategies and techniques to generate and sustain prefigurative struggles is required, and I think I've only glimpsed at the problems. But I still think I've seen enough to make a beginning. Since writing the early drafts of this exploratory working programme, I've found that study of, and struggles about, the labour process provide a very fruitful orienting perspective which promises to unite industrial struggles and the New Left concentration on the politics of process (see below and my review of Braverman in *RSJ*4). This perspective can avoid the extreme theoreticism of the history of ideas and the extreme anti-theoretical activism of a purely workerist strategy. By this I mean that the special claims made for science have led us to treat it and its history and its social relations (both 'inside' the scientific community and in its history and its relations with the rest of society—ultimately a false distinction since the deep structures of those sets of relations are the same) as different from other human practices by virtue of its scientificity. At the other extreme, the focus of many marxist groups and perspectives on the exclusive revolutionary role of the industrial working class (and the growing proletarianisation of scientific workers) has prevented us from seeing the need to develop strategies for praxis for the mediators—the experts in education, in scientific research and in science-based industry. (Time for another reminder that I always want to imply technology and medicine when I say 'science'.) So on the one hand I want to move toward the industrial model in saying that science isn't fundamentally different from industry and should be subjected to the same political and ideological analyses, while on the other hand I want to maintain that scientific politics need not be industrial proletarian ('point of production') politics alone. (This is a slightly misleading way of putting the position, since I would also want to say some things about enriching traditional models for industrial struggles.) Mediators of power and ideology have their own struggles which should be closely integrated with—but still have distinct aspects from—those of other workers.

One of the main reasons I have had for developing these arguments is to begin to search for a practice for these mediators. At the level of theory and related activities, some of us have been trying to get scientists out of the atheoretical and sometimes antitheoretical backwater in which it has operated, by working closer to other left groups in the areas of greater solidarity and cooperation in theoretical work and distribution of publi-

cations (e.g., Radical Publications Group and Publications Distribution Co-op). At the same time, we are trying to say to the rest of the Left that there is nothing very special about science deserving of the sort of deference it gets from radicals whose education led them to hold science in awe. So, we've had to get going in teaching ourselves some political theory, in working with other radical groups and in demystifying science to others. This is a beginning within the Left, but it leaves open the question of what expert mediators in science, education and science-based industry should be up to in their own work and living settings. It's no accident that on the one hand there are many highly-qualified people who have tried and failed to achieve some sort of voluntary proletarianisation, on the other the attraction of life-style and community politics has been very great often with painful results. What are they/we to do? How can we convert these insights and energies into politically relevant struggle?

I am arguing that our left perspectives after the collapse of the student movement, efforts of voluntary proletarianisation and the counter-culture, still have something to offer through analytical work and other aspects of prefigurative struggle to develop towards a counter-hegemonic world view. This is to be done by confronting bourgeois ideology and capitalist power in our homes, communities and institutions. Thus, sexual and life-style politics are central to the task. Our programme is certainly to join and work with whatever traditional trades union structures exist, but I think we have something else to offer as well. The existing metaphysical assumptions of science (which I've discussed at length in earlier writings) continue to play a central role in the ideological hegemony of the existing social order via its provision of claims to certainty and objectivity, underpinning and constituting hierarchical and authoritarian structures and social relations. It is as true at the level of theory as it is at that of other areas of life. As Marx says in a crucial passage in *The German Ideology*,

> The production of ideas, of conceptions, of consciousness, is at first directly interwoven with the material activity and the material intercourse of men, the language of real life. Conceiving, thinking, the mental intercourse of men, appear at this stage as the direct efflux of their material behaviour. The same applies to mental production as expressed in the language of politics, laws, morality, religion, metaphysics, etc., of a people. Men are the producers of their conceptions, ideas, etc.—real, active men, as they are conditioned by a definite development of their productive forces and of the intercourse corresponding to these, up to its furthest forms. Consciousness can never be anything else than conscious existence, and the existence of men is their actual life-process. (p.37)

The union of the conceptions of metaphysics, including the metaphysics of science; the 'furthest forms', including the most esoteric and abstract science; and the rooting of these in life process—makes the essential connections for which I am arguing.

Thus scientific workers and other experts have a key task in beginning to demystify science and its role in authoritarian societies, both in theory

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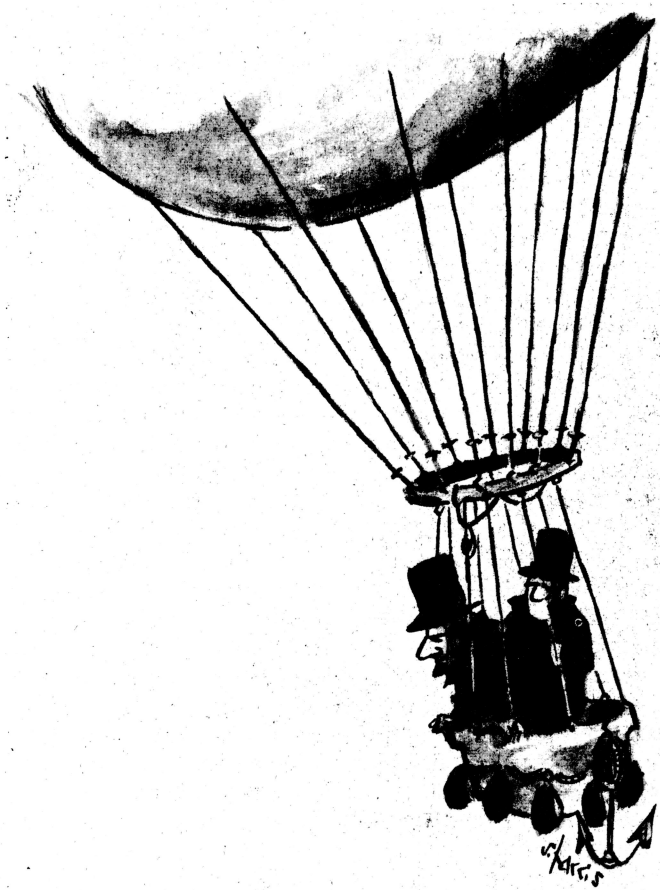

"Is that why you built this, Professor Grinbaum— so you could spit on them?"

and in practice. This is likely to be a relatively special task for them *because of* their mediating role, their education, their reading and theoretical understanding. If they conduct this work out of touch with trades union struggles, their own work will degenerate into idealist self-indulgence. But if it is done in challenging and changing the labour process in institutional settings in concert with working-class struggles, they may have an important contribution to make to progressive politics and revolutionary struggle. Now, having sketched some of the problems of the rest of this essay, what do I mean by New Left and process politics? Once again, it's only a beginning—an invitation to others to generate strategies and take the argument and the struggles further.

The Old Left, The New Left and the Politics of Process

What I want to say now is all jumbled up, and I haven't got the right style or vocabulary to say it. But that doesn't mean that I think there are no stones for a solid foundation in it. I want to give some meaning and content to the conception of prefigurative struggle—to evoke a conception which I can't make properly explicit. I had thought of expressing it in terms of differences between the Old Left and the New Left, but it goes beyond that. Let me move backwards in time and try to creep up on it. What is so exhilarating and moving about Marx—even at his dryest—is that he takes the framework which people experience as 'the way things are', the apparently unalterable laws of society imbedded in laws of nature, and he shows that although experienced as real and although historically necessary, they are part of a terrible, oppressive and exploitative confidence trick which will change partly as a result of its own developmental processes and partly as a result of people joining together in sustained revolt. Political economy is shown to be amenable to critical evaluation (hence the subtitle of *Capital*) and therefore to transcendence through struggle. What characterised the movement which was called the New Left was that it broke out of the restricting framework of Stalinism, preoccupation with the Soviet Union and official communist parties and laid great stress on participatory democracy and spontaneous initiatives by interested groups nationally and internationally, involving direct action and confrontation with bureaucratic and police powers. Some aspects: Hungary; Krushchev's denunciation of Stalin; Castro's revolution; civil rights struggles; Campaign for Nuclear Disarmament; anti-Vietnam War demonstrations; Free Speech Movement and a growing number of student protests and occupations around the world but especially in America, Britain and Europe—as a significant new experience for that generation and for most of their teachers; revival of shop steward and related shop floor militancy; willingness to drop-out and experiment with new ways of living and new experiences, e.g., drugs and the further reaches of rock and progressive music; community struggles and particularly powerful interest-group struggles—blacks, women, gays.

All of these—in various combinations for different people—led to a revival of transcending and transforming strategies which moved further and further away from traditional revolutionary strategies with centralised organisations with hierarchical structures. A lot of the main texts of the period were written by the young participants, but there was also a significant revival and translation of authors such as Rosa Luxemburg, Karl Korsch, Antonio Gramsci, Georg Lukács, along with the increasing penetration of the early writings of Marx and exploration of other dimensions of culture in the greater awareness of the Frankfurt School, especially Marcuse's efforts to draw upon and radicalise Freud for a marxist social psychology. Much of the New Left goes on with its theoretical work, its fashions in translation and its increasing rigour and sophistication.

But there were elements in the above list which seem to me not to be adequately characterised by the label New Left, although they owe a great deal to the general ambiance. If we emphasize the libertarian and situationist and life-style aspects at the expense of the hyper-intellectual and formal ones, we get nearer to what I mean. The tendency I want to evoke has origins and a manner which is less relentlessly theoretical and priorities which are at once more immediate and more visionary. It involves a greater fusion of the personal and the political—making political work and relations more personal and personal relations more political. I recall someone once saying that he couldn't see how the production of a publication—questions of some people doing only editorial work and others doing only production—had anything to do with the significance of its contents. That's the sort of point of view I'm *not* trying to evoke. Efforts towards socialism should, as far as we can manage it, be examples of what we advocate. Above all, political and personal work should be *reflexive.* This perspective owes much to the principled naivety of the student movement and the struggles of the women's movement which had important roots in the way women were treated in the early 60s student movement. Opposers of oppression in one sphere—e.g., black Africans, Vietnamese peasants—should not oppress in other spheres, e.g., women, children, shy people. Music and/or drugs and/or altered life-styles and sexual relations were important for many people who share these reactions and use them as more important indices of others' politics than their supposed theoretical positions. Anti-authoritarians should not be in positions of authority in our own movement. Our conferences on self-management should be self-managed. Opponents of the hierarchical division of labour should not be heads of departments or labs. The hypocrisies of traditional parliamentary socialists and reformers produce endless examples of the issues—a Labour Minister of Health who is phasing out private beds in hospitals is found to have hired one recently. A Campaign for the Advancement of State Education finally passes a rule that none of its officers can have children in private, fee-paying schools, but only after protracted debate. Only socialist processes can produce socialist results.

Thus, competitive, individualist, sexist, patriarchical, authoritarian and hierarchical attitudes, ways of behaving and structures should always be struggled against in ourselves and throughout the movement. It may be very irritating and may break your train of thought, but it's always relevant for a woman to correct you when you say 'he' when it should be 'or she'. Discipline and work should come from commitment rather than from authority and hectoring. No mental labour without manual labour. Criticism and self-criticism are central to struggle. Those are some of the aspects of what I'm trying to convey under the heading of prefigurative struggle in the politics of process.

I wish I could think of a memorable phrase to put next to New Left. It's a new generation of consciousness and practice. 'Politics of process', 'politics of intimacy', 'politics of everyday life', even 'permanent cultural revolution' express aspects of the altered approach and commitment, but none of those phrases come trippingly off my tongue. 'Textures' versus 'structures', we called it in a commune I once tried to live in. If we cast our minds back to the Red Scientists of the 1930s Gary Werskey has studied, we later find them in charge of large labs with professorships and many other markers of hierarchical status and power. Some became heads of Oxbridge colleges and other elitist institutions. The same is true in the liberal arts. I recall one (who would not call himself a socialist but sees himself as radical) who said that he was elitist but not authoritarian. The approach I am trying to convey finds that claim absurd.

Power is not to be seized but dissipated; knowledge is to be socialised. Different aspects of one's life are to be considered in relation to the others: how and where one lives; who does what at home and at work; what boundaries are there/should there be between home and work? What characterises this approach is that it builds on Marx's analysis of the conventional framework of bourgeois economic and social relations, the New Left's analysis of the conventional framework of twentieth-century marxism, but it goes on to consider what aspects of other frameworks and boundaries are to be altered in bringing about socialism. And then it sets out to prefigure the ends in the means. This includes, by the way, the sort of exploratory and tentative way I'm trying to write, knowing that there are false starts and wrong trails and blunders. If we abandon the 'one right way' search for the correct, objective line, we see the search for paths as a much more loose process. It's the antithesis of the hyper-clever and articulate philosophers who live off scoring. I used to encounter them in Cambridge with a mixture of fear and despising. They took great pride in stamping on tentative shoots, lest they turn out to be weeds. Never mind nurturing them in the hope that they might flower: we have to police the garden.

This is all an attempt to convey the second sense in which it's time to move on—the need for our socialism to penetrate and transform our science. But it cannot do that unless it is at the same time penetrating and trans-

forming the rest of our lives. That, perhaps, is the chief difference between new left intellectuals and prefigurative struggle. As Arlo Guthrie said of the inspecting sergeant at his military recruitment, 'leaving no part untouched'. Another expression of the same theme–relating theoretical work and the right to an opinion–is the Italian mother of ten's observation on the Pope's latest ban on contraception: 'He no playa da game, he no makea da rules'. I am still trying to find expressions which evoke the central reflexive or self-referential feature of the development beyond New Left politics, attempting to diminish the distance between theoretical work and practical struggles on the one hand and one's own life on the other. André Breton captured part of it in his 1935 'Speech to the Congress of Writers'. '"Transform the world," Marx said; "Change life," Rimbaud said. These two watchwords are one for us.' (*Manifestos of Surrealism*, p.241) Nearly forty years later Jerry M. Cohen caught the central point in a 'Discussion' in *Radical Philosophy*: 'Many of us, especially those on the libertarian left, believe that the character of the revolutionary movement must as far as possible be made to reflect and display the character of the society we want to build, that the character of that society will be largely determined by the character of the struggles of which it is the outcome.' (*RP*4, p.25) Perhaps, then, I'm talking about what distinguishes libertarian socialists from other socialists: I'm not sure. Another evocation of the impulse I'm after is from a Situationist article on 'The Transformation of Everyday Life':

> In fact, everything depends on the intransigence with which one is prepared to ask oneself: How am I living? . . . In these circumstances, to evade the political problem posed by the poverty of everyday life can only mean to evade the complete boundlessness of one's own demands to live life to the full–demands which could not lead to anything less than the reinvention of revolution itself. . . . Alternatively, if we see everyday life as the frontier between the dominated and the non-dominated sectors of life, and therefore as its most problematic area, then it is vitally important we succeed in replacing the present ghettoes by a frontier constantly expanding in every direction, ceaselessly creating new possibilities. (Gray, *Leaving the 20th Century*, p.36)

Yet it is painfully obvious to those of us who have tried, that we cannot advance on all fronts at once: we haven't got the resources and are too screwed up by our own socialisation and the contradictions in the society in which we live. We need to leaven our struggles with large reserves of compassion for ourselves and realise how crippled we are by our own contradictions. On reading this, Brian Hurwitz wanted it stressed even more and asked me to add a greater sense of the experience of struggle–'perhaps nausea–the hell and difficulty involved. One's depression and despair; feelings of fragility and helplessness. The whole tone is exceedingly gentle but working with people who hold to different aspirations and views of the world is an immensely lonely experience. A point of disagreement spreads into ever-widening rings of different and supportive beliefs, every one of which you want to stop at to sort out, but that just leads to more, and the original point is lost. You walk around wondering what the hell you're

doing spending your life amongst such people.' He is a medical student, working in a hospital.

The problem is to avoid using this anti-millenarian realism as an excuse for doing nothing and to avoid the sort of violent reactiveness which leads one to take out all one's frustrations with oneself and one's work situation on comrades, rejecting them because it's the only outlet when one is stuck with oneself and can't see a way forward in the job situation. Somehow we must combine relentless with forgiving struggle and to decide which contradictions to confront and which to live with for now (knowing full well what they are). The hope of transcending all at once is naive and romantic and denies that the hierarchical, authoritarian capitalist system is a *system* and therefore systematically expressed in the world in which we live, including our most intimate relationships and our secret hopes and fears. So, we are caught between, trying to move towards socialism by socialist means at the same time that we are constrained, squeezed and fucked-up in all sorts of ways by our contexts and ourselves. Reiche has captured the ghastliness as well as the promise of the situation:

> Though therefore it may be true that the qualitative difference between the existing and a free society can only be established through a 'break in the historical continuum', it is equally true, firstly, that this break can only be theorized about in advance in categories, modes of thought and dreams bearing the hallmark of the existing society, and the oppression, exploitation and deprivation of liberty practised in it. Secondly, that it will have to be carried out by people who, though they suffer under this oppression, exploitation and deprivation of liberty, recognize them for what they are, and want to do away with them, are also marked, and maimed by them, in their most minute feelings and habits. And thirdly, that the free society can only be built up on the basis of the maimed and fettered capacities of unfree societies. Otherwise it would be meaningless to say that we already have the intellectual forces necessary for the realisation of a free society. (*Sexuality and Class Struggle*, pp.165-6)

Stark Alternatives: Productive Change or Reproductive Stasis

So we're caught. But there really isn't any alternative to change except the reproduction of existing ways and strucures, and we're supposed to be against that. As it is, radicals find themselves too often and in spite of their best efforts, reproducing aspects of competitive, defeatist and hierarchical structures in their radical work, while some groups even advocate such ways in the name of efficiency. It is very difficult indeed to make progress toward the production of socialist ways of doing things and away from the reproduction of existing social relations–even in our attempts to transcend them. If we turn this insight into the question, 'Is there a socialist science?' we find that there cannot be as long as we find it possible to separate our conception of socialist science from that of the rest of life. We see the need for our socialism to become the basis for our scientific practice (= social

'Quicksand or not, Barclay, I've half a mind to struggle.'

relations), but how can it possibly do that if it isn't becoming the basis for the rest of our lives? Similarly, the struggles which we undertake in our political work outside the narrowly scientific settings—in 'political groups' and in our social relations at home and elsewhere—must penetrate into our scientific work. Struggling against sexism, racism, ageism, division of mental from manual work, hierarchical division of labour, and so on in political groups and the home must not be sequestered, hobby-like, from the same issues 'at work'. Similarly, if we consider with care what practice to undertake in our political work outside the 'work' setting, why not inside it? What about carrerism, what research, what status, what agitation? One begins to see why the claims for value-neutrality of science and for the use/abuse model had great appeal for scientists: they permitted the sequestration of scientific work and careers from the political process, just as it did for so long in industrial settings under the banners of 'production' and 'efficiency'. So, instead of walking the path of value-neutrality and the parallel one of isolated theoretical work, we need to define clearly and to pursue specific struggles, realising once again that one can't get on one's horse and ride off in all directions at once. If we don't prefigure, we'll reproduce the existing society, with all its division of labour, theory/practice split, sectarianism, careerism, and so on. How many radical activities have ground to a halt over structures inside the heads of the participants, soon after the excitement of the first willful enthusiasm? So we must plan, always stretching ourselves

GRAMSCI'S MARXISM
by Carl Boggs; London: Pluto Press, 1976.

A controversial account of one of the great Marxist theoreticians and agitators.

but staying short of pushing too hard and too fast, breaking off and losing comrades whose frailties are different from our own. Of course, it is a high art to know others' breaking point and a higher one to recover comradeship once it has been discovered by going beyond it. Raymond Williams has touched the core of the separations which socialists must break down:

> If socialism accepts the distinction of "work" from "life", which has then to be written off as "leisure" and "personal interests"; if it sees politics as "government", rather than as the process of common decision and administration; if it continues to see education as training for a system, and art as grace after meals (while perhaps proposing more training and a rather longer grace); if it is limited in these ways, it is simply a late form of capitalist politics, or just the more efficient organisation of human beings around a system of industrial production. The moral decline of socialism is in exact relation to its series of compromises with older images of society and it its failure to sustain and clarify the sense of an alternative human order. (*The Long Revolution*, p.133)

Some Examples: Factory and Lab

Many activists in the radical science movement are impatient with liberal dithering and with theory divorced from action. Some of them have turned to the factory as an area for relevant intervention, believing that they have moved forward and shaken the dust of academicism from their feet. This process is parallel to moves made by political activists who became disillusioned and disgusted with the student movement and turned directly to working class neighbourhoods and industrial settings. The same has happened to certain radical publications, e.g., *Radical America*. There is so much to be done on so many fronts that this tendency can only be welcome, but must it be insulated from our understanding of research and academic settings? Scientists and technologists who have chosen to struggle on that front and make themselves available in the areas of industrial health and safety need not leave behind the critique of the university laboratory and the scientific research institute. On the contrary, experience in an area in which the social and ideological nature of science and technology are more direct and obvious should allow them to apply their critiques and their agitational programmes to the academic and research settings with devastatingly demystifying and subversive effects. This is particularly true at a time when the research being conducted at such institutions is being increasingly explicitly directed to capital's ends. Insight and agitation in the hazards of industrial work should therefore be brought back and applied to the disruption of the comforts of research careerism.

I am exploring this form of industrial activism, because it has led to a near-polarisation within the British radical science movement between industrial and community activists on the one hand and academic and theoretical tendencies on the other. Once again, we find ourselves in the radical movement reproducing the very divisions of labour which we are dedicated to breaking down. Let's try to reverse that process. Those of us

whose work has hitherto been primarily in the history, philosophy and social studies of science and technology have much to learn from scientists and technologists who have learned to theorise their own experience and from those who have begun to work in particular technological struggles. I am thinking, in particular of Charlie Clutterbuck's work on vinyl chloride monomer and cancer and on agribusiness, Tony Fletcher's work on noise, Alan Dalton's on oil sprays, Pat Kinnersly's on hazards of work, Tim Shallice's on the technology of repression in Norther Ireland. And they have something to learn from research scientists and students of science who are working on historical, conceptual and social aspects of science and industry, including marxist studies of science as ideology and as production. Critiques of the mainstream of science and those of technology must become part of a single movement or we will merely reproduce the sectarianism which plagues the traditional left. The answer is not for those still at work in research and teaching to adjust their blinkers and remain preoccupied with abstract theory. Nor is it for BSSRS activists to devote all their energies to problems of industrial health. Theory without action is arrogant and empty; action without theory is truculent and blind. The need, once again, is to combine the important work being done in industry with agitation in research and academic settings and for academics to engage in agitational work and theoretical and applied aspects of industrial settings. We must have both critiques and militancy in both sorts of setting. If we can once see that the factory and the laboratory are part of a single mode of production and that the critique of the factory applies equally to the laboratory, we will have overcome one of the major obstacles to a unified critical and agitational strategy.

One example of bringing back the fruits of the analysis of the factory and applying them to the scientific setting, was the conference on 'Workers' Self-Management in Science' mounted by BSSRS in 1972. In the light of recent renewed interest in the industrial sector, the documents and approaches of that conference and related publications should be reconsidered. The critique of 'job enrichment' and the need for struggles toward self-management are more timely now than they were then, and more radicals appear ready to see the relevance and the limitations of that approach. Questions of undermining hierarchies, sabotage of authoritarian structures, the socialisation of knowledge and expertise, the collectivisation of decisions and the rotation of menial tasks are all part of an approach which is suitable to both the factory and the lab. Also common to both is the need to look again at the 'product' and to bring its nature and development into the realm of democratic debate among all producers and potential consumers (particularly important in the case of medicine). Similarly, the demystification of the means of production is a common theme: they confront the worker/researcher as objective and unalterable but are the results of decisions, priorities, struggles and human histories which can be changed. This is as true of ultracentrifuges and kidney

machines as it is of assembly lines and harvesting machines. Finally the conditions of work and hours are themes for common perception and change, just as are the mystifying and alienating dichotomies between work and leisure, factory and home. All of the arrangements about when one works, what one does 'at work' and 'at home' are alterable and negotiable human conventions. What we lack is the imagination, the will and the solidarity to change them. Why isn't ex-Prof. Driver in the creche this afternoon while (post-doc) Anne is unloading the lorry and (ex-caretaker) Andrew is having a read or fondling with someone?

That example may strike you as feeble and wet. I don't want to disown it, but I do realise that the examples of what needs doing in this section are less textured and convincing than those in the section on what needs doing theoretically. This isn't surprising, since I'm obviously in a better position to make relevant subversive proposals in that domain because of my own socialisation. Activists in lab settings and in industry will have to develop their own struggles changing the relations of production, undermining authority, struggling to change research priorities. An excellent model for such struggles is the Lucas Aerospace Combine Shop Stewards Committee (see accounts in *Undercurrents* Nos. 12-16 or write directly for information to E.F. Scarbrow, Secretary, 86 Mellow Lane East, Hayes, Middlesex, England).

Scientists and technologists in industry are in the best position to learn directly from militants in trades unions and are increasingly seeing the point of doing so, as Mandel has pointed out:

> The massive reintroduction of intellectual labour into the process of production . . . has created the pre-requisite for a much broader layer of the scientific intelligentsia to regain the awareness of alienation which it had lost through its removal from the process of direct production of surplus value and its transformation into a direct or indirect consumer of surplus value . . . . This is the material basis . . . for the possibility of involving increasing numbers of scientists and technicians into the revolutionary movement. (Quoted in Gough, 'Marx's Theory of Productive and Unproductive Labour', p.71)

The further one gets from industry, the less obvious and the more mediated are the controls capital exerts. Consequently, the more difficult it is to find and to pull the levers of change. In universities scientists and technologists, research students, and technicians are beginning to see the point of organising and joining the relevant trades unions, while the university authorities have already taken clandestine steps to forestall working class trades union power in their governing bodies. Under the headline 'Dons' secret memo against a "voice" for unions', the following item appeared in the *Guardian* on 11th June 1976:

> Unions representing non-teaching staff in universities have been incensed by the discovery of a confidential memorandum from the Committee of Vice-Chancellors and Principals opposing trade union representation on university governing bodies.

> The memorandum advises university authorities not to change their statutes to permit participation by non-academic staff, and to be "cautious about entering into commitments" in cases where the statutes would already allow it . . . .
>
> The committee decided that universities were "quite distinct from companies" and should not draw parallels with "other organisations" which are actively moving towards employee participation . . . .
>
> The memorandum went on to say that although individuals could be appointed to unversity councils "there were objections to the appointment of trades union representatives as such or to any formal commitment that a proportion of members of council would be chosen from non-academic staff, whether or not as representing trade unions."

The strength of the authorities' objections is sometimes a good sign that the radicals are doing something right. Surely this is a place to try to close the gap between staff, students and other workers—a point the *Times Higher Education Supplement* granted in an unusually shrill leader (25 June 1976):

> . . . the idea that non-academic staff should be in a constitutional position to influence policy decisions which even indirectly affect academic questions probably seems wrong to all but a minority of young and radical lecturers—who may, after all, be members of the same trade union . . . .
>
> But there are weightier objections to applying the principles of industrial democracy to higher education. Higher education is not (quite) an industry . . . . Universities must not be governed by a collection of representatives of assorted selfish interest groups, many of which have only a peripheral interest in the basic purposes of a university . . . . In a specific sense the government of higher education is best left to those who have devoted their lives to academic pursuits. In a general sense its government is the business of every citizen expressed through the democratic process. What it is most definitely not is the exclusive business of ASTMS, NUPE, NALGO—or even NATFHE or the AUT—in spite of their many good qualities. Corporate syndicalism, even dressed up in the demure clothes of industrial democracy, should not be allowed too much weight in higher education—or anywhere else.

The last time I heard that sort of rationalising rhetoric in such a pure form was in the American South before the days of the civil rights movement—'Though nigras are fine people, we know best how to look after them, because we've devoted ourselves for generations to upholding the Southern Way of Life.' The feudal parallels are not accidental. The barriers that university workers at all levels have to overcome in their own minds are as great as the barriers they will have to break through in the government of these institutions.

On the other hand, no one who has had much experience of an industrial setting will be mystified about bosses. They have power and patronage. Even enlightened ones get to decide how generous to be, e.g., about technicians doing research for degrees, taking 'time off', and so on. The official democratic rhetoric about science as a cooperative community pursuing disinterested researches after truth persists in the face of the realities of competitive old-boy (not girl) networks. The idea that merit and truth will make their own way has also persisted in spite of the experiences of e.g., Mendel, Semmelweis, Florence Nightingale, Rosalind Franklin and any number of 'troublemakers'. How many professors fill their labs with

competent but unthreatening junior colleagues or promise tenure for work as a (not very) glorified research assistant? And then often don't deliver that security in compensation for the alienation and deference? We know all these things about industry, but we somehow manage to avoid facing them with respect to science. Comrades from the industrial sphere can help us to see more clearly.

Breaking down the barrier between the substance of science and its social relations and between theory as discussed and as lived, would also make the position of 'senior' scientists intolerable. It's just not on to be in that relationship with other people and to call oneself a radical. Not on; it's that simple. There's no way to abrogate the real power of the position by voluntarily laying it aside, since the rest of the institution still confers it, and one can choose to revert to it at any time. Consider the analogy if a militant shop steward made that sort of move. Here's what one said about being offered a supervisory job at Ford: 'You might as well stab me in the back. I'd sooner be dead.' (Beynon, *Working for Ford*, p.124) But in a scientific lab the professor can be a member of the same union as the technicians–ASTMS–whose membership card says, 'Welcome to the fastest-growing union in Britain. We are recruiting scientists, managerial staff, supervisors, technologists and technicians of all grades in industry and in the public service. So you can be sure that you will be in good company and are joining a union that caters for the elite of white-collar workers.' Scientific settings and scientific trades unions are perfectly capable of mystifying hierarchies and perpetuating elitism, while a healthy dose of insights from a straightforward, unmediated industrial setting could help us to see more clearly. For example most universities have two ASTMS branches–one for technicians and one for research staff. The same sort of professor who can claim to be elitist but not authoritarian can claim that there are still areas of scientific research relatively untainted by ideology. It suits such people not to perceive the unity of science and society, of theory and practice, especially including their own. A richer interchange of insights and struggles between the workbenches of the factory and the lab and their respective relationships with unions could cause quite a subversive commotion.

Some Examples: Transcendent Life Styles

I want to move from the industrial setting to the freaky fringe–to what might be seen as the other extreme of the continuum of radical politics. Having touched on the dangers of mutual intolerance between academics and industrial agitators and having tried to show some of the potential gains of greater comradeship, I now want to try the same sort of thing with the approaches of those who are often dismissive of both industrial agitation and 'heavy academic theory'. I am thinking, in particular, of *Undercurrents* and alternative technology on the one hand and the antiscience movement on the other. Both approaches are symptomatic of a visionary attempt to

see beyond the confines of an alienated science and society and to reach out for the paraphernalia and consciousness of a new cosmos and cosmology. Many of those who were most inspired and then most maimed by the radicalism of the 1960s turned to pure consciousness in seeking gurus or in disappearing without trace into mannerism—converting their revolt into style and their revolutionary long marches into head trips and—latterly—body trips. The phenomenal world became too much for them, so they became religious freaks, swapping the struggle toward a utopia for a 'reality' in consciousness alone. These people are a real loss to the movement for a better world, and it must be said that their solution is very regrettable and objectively reactionary. Nevertheless, there is something in their unwillingness to go straight that still ought to be taken seriously as a form of defiance that radical movements engaged in socially constructive and progressive struggles ought to address by setting out to earn the commitment of such people. Their sense of alienation and revolt—their refusal—is valuable, but its direction must be changed. There is a new grouping in Britain—Alternative Socialism—which might contribute towards this reintegration.

The strength of the antiscience movement and of alternative technology is that their advocates have managed to retain utopian vision while still trying to create concrete instances of it. It is an uncertain enterprise, liable to degenerate at any moment into mere business or mere opting out or being co-opted. But those who can maintain the tension between the

WORKING PAPERS IN CULTURAL STUDIES 10

The first part of this issue will seek to analyse alternative concepts of ideology, from "common sense" formulations to more theoretically developed models within the Marxist tradition. The theorists considered will include Gramsci, Althusser and Poulantzas.

Part II will look more closely at specific ideologies and their areas and modes of operation (eg. in State schools, in "Community Studies", and in relation to the construction of the "subject").

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vision of a better world and the instruments which can serve it, have much to teach those of us who work inside institutional frameworks and traditional anti-establishment organisations. They are actively prefiguring, however uncertainly, ways of life and consciousness and are constantly probing and providing a critique—often in the form of piss-taking—or orthodox scientific and technological thinking. They show again and again that the boundaries and the foundations of existing science, technology, life-styles and consciousness are—like the arrangements in the factory and the laboratory—eminently alterable sets of human conventions.

These tendencies also show us that not only the relations of production but also the means of production must be changed: a society's technology reflects and sustains its ideology (see Peter Harper in *Undercurrents* 5, p.5 and David Dickson's work). The danger of both the alternative technology movement and of antiscience, is that they have been so put off by heavy theory that they will not avail themselves of marxist critiques of the existing ideological, social and industrial order (see, for example, Robin Clarke's review of David Dickson's book in *New Scientist* 16 May 1974, p.423). This is a great shame, since marxism needs freaks, as any reader of the *New Left Review* whose smiling muscles have atrophied could tell you. Unlike the antiscientist Theodore Roszak, Peter Harper has stressed the point that one can only place one's alternative technology and altered consciousness *within* one's radical politics, if it is to be effective. The politics must be basic, and the alternative technology must find its place within that context. There are some signs that the alternative technology movement is becoming very satisfyingly split between those seriously interested in becoming involved in radical struggle and solidarity with the working class, and the rest (see *Undercurrents* 14, pp.10-14 and *UC* 16, pp.12-14).

It is very important to see that the people's technology movement has got a lot further than the Radical Science/BSSRS/Science for (the) People ones in *conducting* lives which break with old patterns and producing things and writings which actively prefigure socialism. Conversely, some who complain most about lack of contact between these freaky tendencies and the working class, are often among those who have done the least to change their own social relations. Couldn't we all devote at least as much energy to asking what we can learn from other ways of trying to achieve socialism, as we do to putting down others' struggles and strategies? As Dylan once said, 'You can be in my dream if I can be in yours.' That was after the bomb had fallen and long after Abraham Lincoln epigrammed on fooling people. We can't wait for or depend on cataclysms.

Alternative Cosmologies: Forms of New Vision

What is it about the writings of Carlos Castaneda, about the Situationists International, about R.D. Laing's celebrations of mad perceptiveness which

has been so attractive to the alienated but politically uncommitted bourgeoisie? All of them offer a loosening of the grip, which the norms of normality of the world we live in, has on our consciousness, the fetters on our imagination, our will, our daring, our organisations. In the drugs and the nutty people and the zany deviants we find hope and space and occasional whiffs of air to breathe. This was, of course, the liberating appeal of rock music and hippies and flower power and communes before they were crushed by the vice whose jaws were commercial control (and tanks where necessary) and contradictions in the heads of the participants. We mustn't let the essential liberating insight get away as we address the problem of organising our revolting behaviour.

When we found attractive the phrase 'the politics of experience', we did so because it finally expressed the rock-bottom realisation that experience itself in its apparently raw and unmediated forms is part of a totality which is in the deepest sense political. Not only this or that experience in a given power struggle in an election or at a place of work, in a committee or a neighbourhood or even a home, a family or a relationship: not only these but experience itself. This means that seeing really *is* believing. We are socialised so that it is so. Once we understand the full generality of the political foundations and nature of experience itself, it becomes odd and unconvincing to seek to make an exception of that class of experiences which we label (in the existing division of labour) 'scientific'. Indeed, bourgeois philosophies of science have reached the same conclusion but balk at its deeply political consequences. To attempt to demarcate the scientific from its illegitimate overgeneralisation to the scientistic and to demarcate these from everyday experience or other forms of reasoning and reasonableness, is itself an exercise ***within*** the political perspective and practice of a world-view.

All experience, including perception itself, is metaphysical, and metaphysics is ideological. People learn to experience by being socialised into a socially-constructed reality of scientific facts and theories, both scientific and scientistic. To create a new perception and experience and reality is the task of socialist vision, imagination and struggle. 'It is through recognising that scientific concepts themselves are political that it is primarily possible not only to be a radical and a scientist, but to be a radical scientist' (Diamond, 'The Politics of Scientific Conceptualization, p.17). This integration leads directly to the need to unite a counter-hegemonic world-view with prefigurative struggle. 'Not only must the old meanings and norms of everyday life be destroyed, but new ones must be constructed in their place. Hence the struggle for ideological hegemony has two phases: to penetrate the false world of established appearances rooted in the dominant belief system and to create an entirely new universe of ideas and values that would provide the basis for human liberation' (Boggs, *Gramsci's Marxism*, p.42).

Connecting It All Up

Let's look at some of the consequences from the point of view of developing an alternative cosmology or counter-hegemonic world-view, for traditional epistemological and marxist issues, working our way back to the point where we were when the marxist concepts of fetishism and reification were applied to scientific facts and theories. The concept of science *as* social relations, i.e., as ideology, does not lead—as bourgeois epistemologists suppose—to relativism but the the demystification of one cosmology and commitment to another—except for those who have distilled out value from fact and remain abstracted intellectuals. The fear of relativism is a liberal's expansion of the moment between demystifying one cosmology and commitment to another. To the liberal ditherer one can only repeat the last lines of Peter Weiss's *Marat/Sade*,

> When will you learn to see
> When will you learn to take sides

Of course—and incidentally—though it does not lead to relativism, it does undermine the scientistic epistemologists' conception of objectivity, one which was itself only a way of conning people into believing that they had no alternative to the present system. 'Reality does not exist on its own, in and for itself, but in an historical relationship with human practice' (Boggs, p.26). 'We know reality only in relation to man, and since man is historical becoming, knowledge and reality are also a becoming and so is objectivitity, etc.' (Gramsci, *Prison Notebooks*, p.446).

What does this mean for marxism? Not only is marxism not a science, but science isn't either, at least in the required sense of a value-free, objective, unequivocal and indubitable touchstone for our conceptions of nature, life, persons and society. So, when marxists speak of the 'correct line' and 'scientific socialism' and seek sharply to distinguish science from ideology and to rest their position on a firm anti-humanistic and post-anthropological basis of marxism-as-science, we can smile, since we have become persuaded that their resting-place, their foundation, is not itself factual but evaluative. Once we have noticed that much marxism is scientism, we must move on to see that science is, too, and to demystify our own scientific scientism and move on to demystify marxist scientism.

This point has analogies in bourgeois analyses. The question of whether or not hierarchical and authoritarian societies are or are not consequences of objective forces and circumstances, is a mystification, since those allegedly 'objective forces and circumstances' are themselves the outcome of human agency. Similarly, what the fetishism of commodities is to economics and knowledge, the social expression of those allegedly objective forces—bureaucracy—is to politics and administration. Both consider social relations as things to be controlled and manipulated and treated under abstract categories according to a set of procedures, under general categories shorn of their sensuous particularity and individual idiosyncrasies: objects and not subjects.

Nearly there. In the critique of commodity fetishism there are two key aspects: mystification and domination. In science, mystification prevents people from seeing that the scientific world-view and particular facts and theories are forged by their own labour from the unqualified raw materials of uninterpreted and unconstructed nature. The aspect of domination appears both in the alienated, reified world-view of science which promised to serve and to free mankind from drudgery via the progress of science and technology, and in the ways in which science and technology, scientific and technological rationality, and scientific and technological experts dominate people, their social relations and their self-perceptions. Of course, they can't be on duty all the time, so their products and artifacts in our lives, our culture and the means of production themselves (the actual buildings and machines and tools and clocks and schedules, and procedures, i.e., the environment, the means of production and the labour process) are ever-vigilant: they don't *constrain* our world and our experience; they *are* our lives. People are dominated by their own products, including their philosophies of nature, persons and society, of which the paradigm of explanation of modern science is a central expression and bulwark. Both the mystification and the domination lead people to be the deferential victims of historically-created systems of ideas and their material manifestations. We treat our social relations as if they were laws of nature in economic and social theory. These, in turn, rest on a more profound mystification: treating the laws of nature as though they were laws of nature.

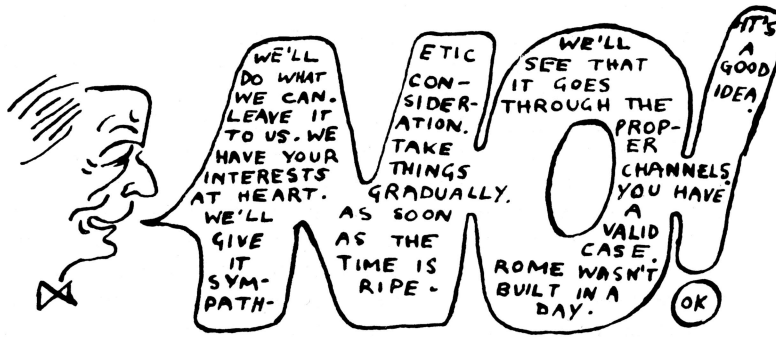
Conclusion

Science is social relations. We now have one sort, namely the hierarchical and authoritarian social relations of capitalism and state capitalism. If we want another sort, we've got to make it happen. In order to do that, we must develop an alternative vision, coupled with alternative ways of living and being. Now. In order to bring about socialism and socialist science, we must become socialists. We can read, teach, do research, turn up at marches and conferences and even create talks, papers and magazines for a lifetime without changing our lives. Until what we read, organise, etc., is referred back into the most intimate aspects of life, until we move with that mixture of fear and exhilaration which marks real change, we're just posturing and farting. It becomes essential to take binding steps which cut off one's line of retreat, to try to do irreparable damage to one's bourgeois self and make irretrievable expressions of commitment to radical change: to become a marked person whose availability for anything that might come along and whose freedom for future change of commitment have been cast aside. In the end we have to fix it so they wouldn't have us back even if we wanted to come. To have no place to go but forward to fix *them* by dismantling the whole structure of the existing world. To take sides against the actual.

Along the way we must learn to theorise our own practice and to practice

our own theories—to combine the vision of an alternative world with prefigurative struggle in our own daily lives, including our social and sexual relations with the same and the other sex at work and at home. This involves deciding which commitments are primary and basic and orienting the rest of life around those, letting the rest find their own level, however weird and contradictory the results. Of course, some contradictions become unbearable, and relaxations and compromises become (hopefully temporarily) necessary for survival. Much collusion is inescapable, but much also can be struggled against. Systematic collusion with hierarchical and authoritarian status and career and familial structures from which one derives significant benefits for oneself is not, however, on, if one intends any serious and authentic radical commitment. But socialist solidarity must fill the gap left by removing the compensations and comforts of careerism. Otherwise comrades will fall by the wayside and get on the next factory bus that comes along or the one after if they have a phreak interlude. Struggle. Compassion. Solidarity. Organisation. Ask not if your comrade has arrived but if s/he is struggling and how you can be in solidarity with that struggle. The same is true of the need for criticism and self-criticism.

Theorising our own experience is frightening in two ways. First, it is easy to fall prey to, or be accused of, retreating into self-preoccupation and self-centredness as part of the ideology of competitive individualism. The embarrassment that greets the articulation of one's own political and


WE'LL DO WHAT WE CAN. LEAVE IT TO US. WE HAVE YOUR INTERESTS AT HEART. WE'LL GIVE IT SYMPATH-
ETIC CONSIDERATION. TAKE THINGS GRADUALLY. AS SOON AS THE TIME IS RIPE.
WE'LL SEE THAT IT GOES THROUGH THE PROPER CHANNELS. YOU HAVE A VALID CASE. ROME WASN'T BUILT IN A DAY.
IT'S A GOOD IDEA.
OK

intimate experiences 'in public' and the more normal reticence and speaking in the third person or of a generalised 'we' (both of which I've done here for the most part), reproduce rather than transcend the existing social ideology. This protects and husbands the political essence of intimacy and sequesters it from overt politics. To be 'impersonal' is to be alienated from oneself and one's comrades. The second problem is diffidence. If one is successful in one niche in the division of labour, it is frightening to begin anew in unfamiliar literatures, practices, relationships and adventures—to develop the nerve to enter strange domains and settings and find one's own way about. But overcoming both of these forms of insecurity and self-doubt are central to the project of living our radicalism, and mutual solidarity and support are essential prerequisites. Let's encourage one another and help those who are serious, to become stronger and those who are tourists to destroy their transit visas or move on soon.

Because we have to move on ourselves, in two ways. In our theoretical work our alternative cosmology or counter-hegemonic world-view should be reached directly via marxist arguments, not bourgeois sociology and anthropology of knowledge. In our practice, we need to move on to lives which struggle to prefigure socialism as the way of bringing it into being. It is propaganda by deed. The old anarchists used that conception as a rationale for assassination of heads of state and of large corporations. Now that we know that technological societies are much more complicated than that, we

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- Are they innate in the mind?
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have to go in for very different theoretical and practical deeds. On the assumption that there is not going to be a violent seizure of the central organs of power in advanced technocratic societies and that we have to transform the whole of the twenty-four hour working day, we are going to have to get going a dialectic between learning to think radically and to live radically and make that very persuasive. Bruce Brown has nicely summarised the project of prefiguring the ends in the means:

> Characterising this new praxis is a panorama of practical-theoretical development that can be described as follows: it begins with the individual's personal experience of oppression and of the fragmentation of experience which makes authentic experience impossible for her or him; it leads from the discovery of this alienation to the individual's refusal of it through a process which is best described as the *politicization of oneself* and which aims at a retotalization of the individual's experience; it develops further through the individual's collision with the inertia of an oppressive social reality in his or her search for authenticity; with this recognition of the social sources of the individual's malaise, it leads to the inauguration of a radical contestation of existing institutions on the level of everyday life carried out by small groups and collectives, and extended through their spontaneous multiplication as micro-social centres of resistance; it finally attains a truly social dimension, uniting the struggle for the creation of a new self with the struggle for the creation of a new society, through the emergence of new needs and capacities for self-organization within broad sectors of the population and the attempt on the part of these groups to engender the creation of new forms of self-management (or, as the French call it, *autogestion*) through every sphere of social activity. Thus, from all sides, the eruption of localized centers of contestation and the further politicization of these contesting currents lead to the demand for a new collective self-regulation of life, for a generalization of self-management throughout society. In this sense, self-management becomes both the principal means and the method for the reconstruction of everyday life and, simultaneously, the principal goal of this reconstruction. (*Marx, Freud and the Critique of Everyday Life*, pp.189-90)

Two caveats about the intermediate position of scientists, technologists, medical and other experts: First, the attempt to find a practice for mediators needs to occur without failing to work in solidarity with the working class, whose more complete proletarianisation too often means less personal, economic and ideological space in which to choose the fronts on which to struggle. But attention to this aspect of solidarity should not blind us to the fact that most scientific workers have hitherto had no practice at all which is politically progressive, and surely equal first on our priority list must be finding a way of mobilising ourselves while ensuring that it is done in solidarity with industrial 'point of production' politics. The second caveat takes the form of the pitfalls of false-consciousness which lie in front of anti-authoritarian gestures on the part of the well-off. There's this fellow driving along in his 50mpg/50mph Citroen 2CV. High. A cop stops him and makes him shove the window open. 'I think you're pissed,' says the cop. 'How dare you talk to me like that, you pathetic bosses' running dog,' says our hero. 'You're flatfooting it, and I'm feeling groovy.' 'Get out of that car,'

says the cop, angrily, 'I'm going to breathalyse you.' 'Breathalyse me!' says our movement man, contemptuously. 'I'm high on the best, and all you can think of is pathetic booze.' The cop goes apoplectic. Draws a circle on the pavement and says to our revolting friend, 'Stand in that circle and don't move a fucking muscle!' Then the cop rips the steering-wheel off the column and smashes it into the vent grille, breaking the instruments and wiper motor on the way. He turns around and struggler is laughing, standing in the circle. The cop goes berserk. He runs round to the front of the car and kicks in the headlamps. Looks up at our boy standing in the circle, killing himself laughing. The cop runs round the rear of the car, clambers up the back and jumps through the canvas roof and rips out the chair springs front and back. He looks up. Counter-hegemony is laughing hysterically. 'What are you bloody laughing at?' the cop says. 'Every time you turn your back, I jump out of the circle,' he smiles prefiguratively.

Afterthought

If we are going to move on in theory and in practice toward a counter-hegemonic world-view via struggles which prefigure socialism and seek to bring about socialist science, we're going to have to change both our ways and our thoughts. Here's an idea. If science is not neutral, then fact and value are inextricably intermingled, just as space and time are. Fact, value, space and time meet in the *event.* So let's use that concept more. The improvement in language is noticeable. Not 'What are the facts, and whom do they serve?' but 'What events do we want to make happen, and what is our practice?' You can also concentrate on creating certain models and sorts of events—a happening, a spectacle, a scene, a life-style, a way of life: call it socialism. A revolution, of course, is a process, not an event. Processes are made up of events. If we're not waiting for a cataclysmic event, we must be engaged in a process of struggles—radicalisation of reality by means of socialist practices which prefigure and seek to bring into being an alternative cosmology—that of socialist people in a socialist society, served by socialist science and technology in a socialist world and cosmos. (Stop Press. While I was retyping this yesterday, they landed their technology = social relations on Mars.)

It is also intuitively accepted in our society that people—both witnesses and participants in them—see events differently. Although this is true of almost all facts, the relativity of facticity depending on one's viewpoint is still counter-intuitive to most people. So it may help us to purge our language of facts and learn to counsel and conjure with events—events which should never be conceived out of relation with human experience and social relations. In the end, let's try to see more clearly—as we bring it nearer—a world in which there are not facts then values then people—but one in which there are only events, all of which are human events. If

we're going to get there, however, we're going to have to get a move on.

Many's the time I've been mistaken
And many times confused
Yes, and I've often felt forsaken
And certainly misused.

Oh, but I'm alright, I'm alright
Just weary to my bones
Still you don't expect to be bright and bon vivant
so far away from home
So far away from home.

I don't know a soul who's not been battered
I don't have a friend who feels at ease
I don't know a dream that's not been shattered
Or driven to its knees.

Oh, but it's alright, it's alright
For we did so well so long
Still when I think of the road we're travelling on
I wonder what's gone wrong
I can't help it, I wonder what's gone wrong.

–Paul Simon

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la course ou la vie

Cette nuit, je me suis demandé, une fois de plus, pourquoi je n'arrivais pas à écrire dans Impascience. Quoi ? Un beau papier, bien torché, intelligent, sur la Science ? Non, vraiment, je ne peux pas. Peut-être parce que la physique, c'était pour moi une affaire de cœur. Même après coup, on ne peut en parler qu'à quelqu'un qu'on aime. Je, en tout cas. Alors j'imaginais comme une lettre, une vraie lettre, écrite d'une traite, d'un même fil, sans queue ni tête. Cette expression, elle est curieuse, non ? Elle me ramène à la science. Sexe mâle, comme on sait ; mais où est la jouissance ? La tête, apparemment, ne fait pas défaut, mais à quoi bon ? ... Pour moi progressivement, ça a perdu son sens ; justement, comme on dit : perdre la tête. C'est ce qui m'a décidé à m'arrêter.

Et pourtant, oui, ça me plaisait bien : la tête (la mienne, cette fois) qui tourne rond ; arriver à faire sans trop d'effort, non les découvertes grandioses auxquelles j'avais rêvé sans y croire, mais des trucs quand même pas minables ; et éprouver du plaisir, beaucoup même, à être reconnu, bien vu, par mes pairs : ceux pour qui, sur le plan scientifique, j'avais de l'estime (à eux, j'ai encore du mal à dire : la physique, c'est fini pour moi). J'étais un peu horrifié de ce plaisir, mais, peut-être, ce mouvement de recul me permettait-il de garder juste la distance qu'il fallait : je pouvais voir, dans la mise en scène de la science, la part de guignol ; y jouer mon rôle ; et aussi, jouir du spectacle. Enfin... Basta !

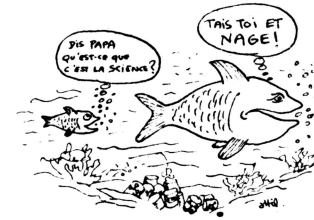
Maintenant, je m'en rends compte : j'y ai échappé belle, en m'arrêtant. J'avais à peu près réalisé mes rêves d'adolescent – ou ceux de mes parents – devenir un "savant", faire des "découvertes", être connu et reconnu. Mission accomplie, bonne chose de faite ! Mais qu'est-ce qui me restait, comme avenir ? Ou bien, faire mieux ; et comme, selon mes standards et mes possibilités, les derniers articles que j'ai écrits sont bons, ça voulais dire qu'il allait vraiment falloir que j'y mette le paquet, et je n'en avais pas du tout envie. Oui, mon truc, j'aimais bien (ça m'intéresse même encore un petit peu, d'en parler, comme ça, de temps en temps), parce que j'y étais habitué et que je savais y faire (y, comme disent les savoyards). La physique en général, il y a belle lurette que ça ne me passionne plus... Peut-être encore les étoiles... Il resterait là un coin de rêve... Mais pas assez pour m'y mettre. Ou bien, autre solution, celle qui me pendait au nez : la répétition, de moins en moins bien. Avec (pour compenser ?) les commissions, les présidences... Ouh ! Rien que d'y penser, de m'imaginer condamné à vie : affolant. La mort, quoi !

Mais tout ça, je n'en étais pas conscient quand je me suis arrêté il y a un an et demi. Parce que sur le moment, ce qui dominait, c'était l'angoisse. Quand on s'arrête, on mesure, à l'intensité du manque, le rôle inavoué de cette drogue. Alors, pendant des mois : résister à la tentation de combler prématurément ce vide ; ne pas se donner le change, en remettant ça, dans un autre domaine de la science.

De l'angoisse, il m'en reste encore, mais qui, de jour en jour, fait plus de place à cette sensation très merveilleuse j'ai devant moi une nouvelle vie, celle que, maintenant, je veux choisir. Je peux, sans panique, laisser l'avenir ouvert : ne pas me refourrer dans une case, sous une étiquette. Quelle curiosité, d'avoir à découvrir ce que le futur réserve !

Une chose que je sais, pour sûr : je suis toujours chercheur ; plus qu'avant, sans doute. Ca veut dire, qu'ailleurs qu'en physique, j'ai envie de faire des choses avec ma tête – mais pas seulement avec ma tête – : répondre à des questions qui m'importent. Je sais maintenant que c'est possible. Il suffisait d'être patient, de laisser venir... Bien sûr, logiquement, je devrais dire ici ce que je fais maintenant. Mais alors, quoi ! Encore vendre sa salade, avoir à rendre compte ! Pirouette... Et puis, de ce qu'on fait ensemble, on ne parle qu'ensemble... Une autre fois, peut-être, pas envie aujourd'hui... De plus : n'est-ce pas à chacun de découvrir son désir ?

Une chose me plait dans cette "nouvelle recherche" : être sorti de la compétition que je crois, dans la science, inévitable : accumuler les connaissances ; si on n'est pas le premier, ça ne vaut rien. (Etre le premier parfois, dans mon petit domaine, je ne détestais pas...). Affaire de mecs, comme le disent les femmes ; oui, sûr. Maintenant, je vis autre chose, j'y trouve d'autres plaisirs : liberté, à l'abri des regards ; possibilité de fraternité chaleureuse, une fois la concurrence abolie, une fois supprimés les troubles délices de la signature. C'est plus féminin, et toute une partie de moi y trouve son compte.



Dernier point : mes rapports avec l'Institution (y faut-il un grand I ?) : rien de bien glorieux : je fais le mort. C'est d'ailleurs la politique de l'autruche, parce que, dans le milieu, tout le monde est là, à épier ; c'est comme une rue de village, avec les commères derrière leurs carreaux : "le pauvre, il est devenu fou, il s'est laissé entraîner, etc...". Ca ne me revient qu'indirectement ; à moi, on ne dit rien ; mais regards vagues, un peu gênés, dans les couloirs. Bizarre... Mais, après tout...

Pourquoi irais-je provoquer les ennuis ? Et pourquoi, par ailleurs, irais-je cracher à la gueule de ceux qui furent mes amis, même s'ils me sont, pour la plupart devenus étrangers – et c'est bien un peu triste – ? Car autrefois, j'y ai vraiment cru, à la communauté scientifique et à tout ce qui s'ensuit ; et ça m'a fait mal, après 68, de m'apercevoir que c'était une idée complètement naïve, qu'il fallait abandonner. Le seul lien qui me restait avec le milieu, c'était la recherche en physique : j'ai mis du temps à le couper ; ça a été pénible. Maintenant, ça va ; la voie est libre pour faire et vivre ce que je veux vraiment. Alors, de cette affaire de cœur, il ne me reste pas d'amertume. Une page est tournée. J'aime ailleurs.

Letter

INTRODUCTION

Impascience is a radical scientists' journal in France which has been going for longer than RSJ has. It has our commitment to politics—but different format, different politics (articles are unsigned on principle), better graphics.

We're printing Loup Verlet's article/letter about his decision to quit physics from *Impascience* because we too think that the way that people talk about their experience of scientific work is an important part of our hoped-for content—and we haven't enough of it; while Loup Verlet's article is a very good example of what we want. This position is one we share with *Impascience*, and the article is reproduced in French on p.132 not for French speakers to check on the translation (which is very free) but to remind readers that there is a wider movement—and to show our solidarity with it.

Loup Verlet

Tonight I wondered again why I'd never managed to write an article for *Impascience*. Write what? A neat, well-polished intelligent paper on Science? No, I really can't. Perhaps because for me physics was an affair of the heart. Even after leaving it one can only talk about it to someone one likes. (I should say 'I' not 'one'.) So I was imagining not an article, but a letter, a real letter written in one stroke, without taking my pen off the paper—no head, no tail.* That's a funny way of describing it, isn't it? It takes me back to science. We all know science is male; but when discoveries come, where's the fun? It seems that it's got a head, at least, but what's the use? . . . Increasingly it lost sense for me; as they say, lost its head. That's what made me decide to stop.

But all the same I enjoyed it; a working head (my own, this time). Without too much work I got at results, not the grand ones I'd fantasised, but things which were worth something. And I really got pleasure from being

*The joke on 'letter' comes across in English. Head and tail are 'appendages' above and below the line—the intellectual and sexual implications are meant.

recognised, even admired, by my peers. I mean the people who counted for me scientifically (it still hurts me now to tell *them* I'm finished with physics). I was shocked at my enjoyment, but perhaps the shock itself allowed me to stand back, keeping just the right distance. I could see the drama of science as a puppet show, play my role in it, and enjoy the spectacle at the same time. Finally – Cut!

Now I look back, I see I've had a lucky escape, stopping when I did. I'd just about realised my adolescent dreams–or those of my parents–by becoming an 'intellectual', making 'discoveries', being known, well-known. Mission accomplished, a good job done! But what was left for my future? Either to do better–and since my last articles were good, by my standards, within my capabilities, that would mean that I'd really have to up the ante. And I didn't want to do that at all. Yes, my own stuff, I liked it (even because I was used to it and because I knew how to make out there. Out there. But physics in general stopped exciting me a long time ago . . . . Perhaps the stars still do . . . . I still have a corner of a dream there . . . . But not enough to get down to them. Or the other way out which was dangling in front of my nose–turning the same tricks less and less well. With (as compensation?) committees, chairmanships, . . . Ugh! Just to think of it, to imagine myself with that as a life sentence–I'd go mad. It's death, isn't it?

But I hadn't got all that worked out when I stopped a year and a half ago. Because at that point the most important thing was the pain. Stop, and you can measure, by the strength of your loss, the unrecognised role of this drug. And so for months you have to resist the temptation to fill the emptiness prematurely; you can't let yourself off the hook by being taken in–by another area of science.

The pain's still with me, but every day it's giving way to this fantastic feeling: I have a new life ahead of me and this time I want to choose it. Without panicking, I can leave the future open; I don't have to be crammed into a box and labelled. How curious I am, forced to discover what my own future holds in store!

I know one thing for sure: I'm still involved in 'research'; more than I used to be certainly. Which means that–in other areas than physics–I want to use my head–but not only my head–so as to answer the questions which matter to me. Now I know that it's possible. All I needed was to be patient, to let it come . . . . At this point, logically, I ought to come clean and tell you what I'm doing now. But then–so what? For me, it would be putting up my goods for sale again, accounting for them . . . . Just a pirouette . . . . And then, we're doing it collectively, we should talk about it jointly . . . . Maybe another time, I don't feel like it today . . . . Anyway: don't you have to discover your own desires?

There's one thing I like in this 'new research': I've got out of the competition which I think is inevitable in science: get your facts together: if you aren't the first, nothing doing. (Sometimes, being the first in my own little field wasn't a bad feeling.) As women say–men's business. Yeah. Now my

life is different I find new pleasures in it: freedom, with no onlookers; the chance of comradeship, once competition has disappeared, and we've lost the disturbing pleasure of signing your name to an article. It's more feminine, and part of me gets a great deal of satisfaction out of that.

The last point: my relation with the Institution (does it have to have a capital I?): nothing heroic: I play dead. It's an ostrich's strategy, because where I work everyone else is on the spot spying; it's like a village street with the old ladies behind the lace curtains: 'poor thing, he's gone mad, he's let himself go, . . .' I only hear of it indirectly; no one says anything to me; but people look at me distantly, a bit awkwardly, in the corridor. Strange . . . . But after all . . . . Why go and look for trouble? And why, incidentally, should I shit on people who were my friends, even if they've mostly become strangers–and that's a pity–? Because before, I really believed in the scientific community, and in all its consequences; and it hurt after 68 to see that it was a completely naive idea that I had to give up. The only link I had left with these people was research in physics: I took time to cut that one, and it was painful. Now, it's okay; the road's clear for me to do and live as I really want. So, this 'affair of the heart' leaves me no bitterness. I've turned the page; I've a different love.

Contributors

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GAVIN BROWNING teaches science and mathematics in a London comprehensive school after several years as a research chemist. Active member of BSSRS; Science Fiction addict for 20 years; member of N.U.T.

BOB YOUNG divides his time among familial, theoretical, clerical and manual aspects of Left solidarity, including *Radical Science Journal*, Publications Distribution Coop, Labour Process Historians' Project and Radical Publications Group.

LOUP VERLET is 45. He's been involved with science for twenty years; still a discreet passenger aboard the Institution, doing nameless research. He is presently finishing a collective book (with colleagues, workmen and employers) about reducing the toil of work: 'Two hours a day'.

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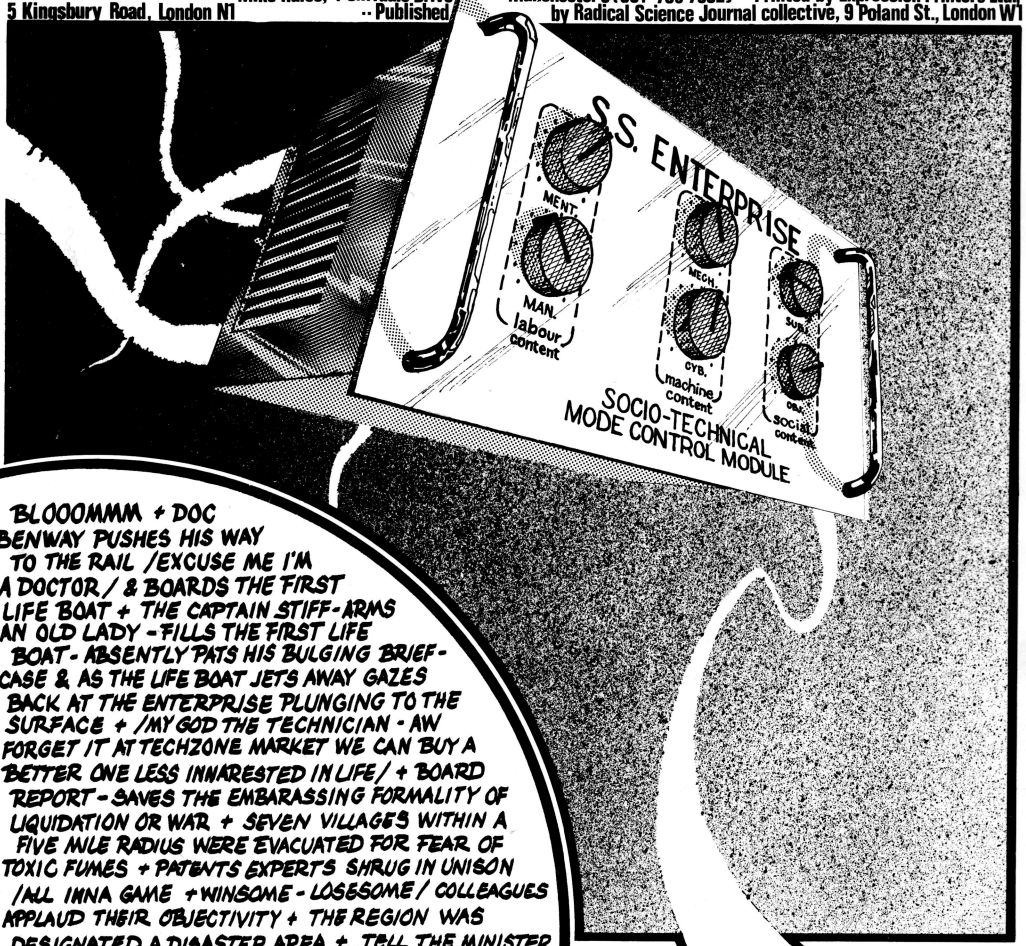

BLOOOMMM + DOC BENWAY PUSHES HIS WAY TO THE RAIL /EXCUSE ME I'M A DOCTOR/ & BOARDS THE FIRST LIFE BOAT + THE CAPTAIN STIFF-ARMS AN OLD LADY - FILLS THE FIRST LIFE BOAT - ABSENTLY PATS HIS BULGING BRIEF-CASE & AS THE LIFE BOAT JETS AWAY GAZES BACK AT THE ENTERPRISE PLUNGING TO THE SURFACE + /MY GOD THE TECHNICIAN - AW FORGET IT AT TECHZONE MARKET WE CAN BUY A BETTER ONE LESS INNARESTED IN LIFE/ + BOARD REPORT - SAVES THE EMBARASSING FORMALITY OF LIQUIDATION OR WAR + SEVEN VILLAGES WITHIN A FIVE MILE RADIUS WERE EVACUATED FOR FEAR OF TOXIC FUMES + PATENTS EXPERTS SHRUG IN UNISON /ALL IMNA GAME + WINSOME - LOSESOME/ COLLEAGUES APPLAUD THEIR OBJECTIVITY + THE REGION WAS DESIGNATED A DISASTER AREA + TELL THE MINISTER (DEVELOPMENT GRANTS AND GALACTIC APPROPRIA-TION) THE CAPTAIN WILL SEE HIM NOW + MEANWHILE.....

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